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THE SIGHT-SAVING REVIEW

March, 1933

"Let There Be Sight"

Volume III
Number 1

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Sight Saving in 1932

WE review here the past year's organized effort to conserve vision

THROUGHOUT the past year the National Society for the Prevention of Blindness has had evidence that the present economic crisis will have its effect on the eyesight of the future. City and state welfare departments have reduced activities, not because of a diminution of need, or of interest, but because budgets have had to be cut. Never has the necessity for assistance from voluntary agencies to maintain a normal health standard been so great. Dr. Shirley W. Wynne, commissioner of health of New York City, writing recently in the SIGHT-SAVING REVIEW, pointed out the dangers of malnutrition and lowered health standards to the eyesight of the young.

The Society feels that at the present moment it should direct its activities especially toward the maintenance of morale and toward assistance in carrying on conservation of vision projects in needy communities. We must prevent, as much as possible, the closing of sight-saving classes. We must urge, more than ever, the vigilant prophylaxis of babies' sore eyes. We must help safety engineers to secure the necessary appropriations for preventing eye hazards in industry. We must collaborate in every way with all those in the various fields of sight conservation who are struggling along on reduced budgets. Such a program is not inconsistent with the activities of the National Society in the past; many of our projects are co-operative. For convenience, we are presenting the 1932 program according to projects.

Ophthalmia Neonatorum

The problem of the prevention of babies' sore eyes (ophthalmia neonatorum) has by no means reached complete solution, although

the incidence of the disease has been greatly reduced in the past decade. The percentage of children who are blind from this cause, among new admissions to schools for the blind, rose to 7.8 per cent in the past year. While this is an increase of only 0.3 per cent since last year, it is an indication that greater efforts must be made for the use of prophylaxis in the eyes of the newborn. In addition to continued efforts to educate the public on ophthalmia neonatorum —through pamphlets, radio talks and personal interviews—the Society maintained its collaborative relationship with the State and Provincial Health Authorities. It is hoped that with further research a container for the prophylactic will be developed which will prevent chemical decomposition and, at the same time, meet the test of practicality for doctors, health departments and hospitals.

Syphilis

Unfortunately, it is still little known among the general public that early treatment of the syphilitic expectant mother, by removing the danger of transmitting this disease to the unborn child, reduces to a minimum the possibility of blindness or diseased eyes in her child. The Society makes known, as widely as possible, the fact that if the syphilitic patient is not treated the disease may extend to the eyes and cause serious impairment of vision, or blindness. The adult who is afflicted with syphilis can greatly lessen the possibility of eye difficulties if he receives adequate anti-syphilitic treatment. In carrying on its program of public information on this aspect of prevention of blindness, the Society utilizes the media of literature and lectures, and co-operates frequently with social hygiene agencies.

Preschool Vision Testing

Although we are living in an era when society's interest is centered on the care and development of the young, only one preschool child in 25 has the advantage of a vision test before entering school. Feeling that it is of utmost importance that the child be provided with the right start, the Society during the past seven years has developed and demonstrated throughout the United States a technique and equipment which may be used by teachers,

nurses and other non-medical workers for testing the vision of the young child. A survey indicates that one county of every four in the United States is doing some vision testing. Only six states have incorporated it as a part of their prevention of blindness programs. One of the major activities of the Society is to promote universal vision testing of children under school age.

In spite of the fact that there has been no reduction in the requests for demonstrations of preschool vision testing, the Society found it necessary, in the interests of economy, to cut down the number of demonstrations. Only 78 demonstrations were made in 21 cities, as compared with 103 demonstrations in 42 cities during 1931.

Eye Accidents in Child Play

Every year hundreds of children are hurt by playing with firecrackers, fireworks and toy firearms. Scores of them lose their sight or injure their eyes. Some communities have laws regulating the sale of fireworks, but there is great laxity throughout the country in enforcing these laws. While such legislation is necessary, the major responsibility rests with parents and teachers. The Society secured the co-operation of governors, mayors, local safety councils and influential citizens, generally, in its effort to stamp out this menace to childhood. The publication and distribution of our pamphlet, "Eye Accidents in Child Play," crystallized sentiment on this subject and, indeed, resulted in additional and more stringent laws in some cities.

Clinics for Cross-Eyed Children

It seems almost inexcusable that there should be any children left with cross-eyes, when we realize that it is an affliction which usually can be corrected early in life. The cross-eyed child is frequently a behavior problem because he is self-conscious and suffers from a sense of inferiority. Unfortunately, it is popularly believed that cross-eyes can be outgrown. Parents often neglect to have the defect in their children's eyes corrected until too late to avoid the physical or psychic involvements. The Society is striving to inform parents, through popular literature, lectures,

and the newspapers, of the urgency of early treatment for the young cross-eyed child.

During the past year, several communities established clinics for cross-eyed children whose parents cannot afford the long and expensive treatment under the care of a private physician. Several of these clinics are in New York City; one is in Philadelphia; and another is in Cincinnati. While it may be too soon to forecast the success of the work being done in these centers, it is hoped that it will prove an added accomplishment in the program of saving sight.

Eye Health in the School Program

Twenty-six million children throng the schools of the United States. Many of them are accorded the benefits of vision testing, adequate lighting and hygienic surroundings, but millions do not have the advantages of good eye care. Not only must the school child's eyes be protected, but he must learn how to protect them and how to use them properly throughout life. The pamphlet, "Conserving the Sight of School Children," issued by the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association, in co-operation with the Society, is informing school officials on this subject; the demand for this pamphlet was so widespread that two large editions have been exhausted. In the face of difficulty in balancing its budget, the Society must, because of the pressing demand, issue a further revised edition early in 1933, and is already engaged in its preparation.

The Society co-operated with the Illuminating Engineering Society and the American Institute of Architects in formulating a new edition of "Standards of School Lighting." It is hoped, through the general dissemination of this information to superintendents and boards of education, that the lighting in schoolrooms will receive more consideration.

In collaboration with the East Harlem Health Center and a school health committee of the New York City schools, a portable, miniature exhibit, illustrating proper lighting in the home, was prepared. This exhibit will be demonstrated, in conjunction with miniature exhibits on other health subjects, in the public schools of

New York City and, later, it will be available to clubs and settlements.

Sight-Saving Classes

There are still 45,000 children in the United States who have such seriously defective vision that they cannot receive their education in the regular classes, but should be in special sight-saving classes. It is gratifying to note that 15 new sight-saving classes were established during 1932, making a total of 413 classes throughout the United States. The Society must continue aggressively to promote the establishment of sight-saving classes; and must assist in keeping in operation those already established, especially since the present economic pressure has forced the reduction of budgets in the municipal and state departments of education.

The *Sight-Saving Class Exchange* is one of the most effective agencies for promoting interest in this phase of our work; it circulates not only among sight-saving class teachers, but among supervisors and directors of special education. Because of the need for retrenchment, the Society had to cut down the number of issues to three in 1932, as compared with four to six issues in previous years.

The Society was instrumental in inaugurating a sight conservation program in Hawaii and, further, in the establishment of the first sight-saving class on the island, which is to open shortly in Waikiki.

Worldwide interest in sight-saving class work was evidenced by the fact that it was the special topic of discussion at the annual meeting of the International Association for Prevention of Blindness, held in Paris, in November. By request, the National Society's delegate presented the latest developments in sight-saving class technique, as well as the observations made during a brief study of some of the European sight-saving classes.

Training Courses for Sight-Saving Class Teachers

To meet the need for specially trained teachers for sight-saving classes, the National Society continued its co-operative activities in promoting courses in various universities. Such training was offered during the past year in the following institutions: Colum-

bia University; University of Cincinnati; University College, University of Chicago; and State Teachers College at Buffalo. Considering the reductions in educational appropriations and the lowered salaries of teachers, the courses were well attended.

Medical Social Service in Eye Clinics

There are many diseases and conditions of the eye which require continual treatment to prevent blindness or further impairment of vision. Such conditions are discouraging to patients, many of whom do not realize the danger of a lapse in treatment. Further, their difficulties call for a social adjustment and the assistance of someone to act as interpreter, between the doctor and the patient, of the many factors involved. Especially is this true among clinic patients, because the physician usually lacks the necessary time and privacy in which to emphasize the importance of regular treatment. The late Dr. George S. Derby, who was one of the Society's directors, felt that the problem in the clinic could be solved by the engagement of a medical social worker for follow-up work. He said, in proposing the employment of medical social eye workers:

"Glaucoma causes one-quarter to one-third of blindness occurring after middle life. If the cases are seen early enough, a considerable amount of blindness may be prevented. Even when seen late, the rate of visual deterioration may be considerably retarded. Because that sight which has been lost cannot be restored to them, and because the age at which glaucoma is generally found is a discouraging period of life, these patients need special help, medically, mentally and spiritually. Unfortunately, the busy clinic doctor has time only for medical aid; the rôle of friend and adviser must fall upon the social service department of the hospital."

As a result of this presentation, a full-time medical social worker was engaged for the glaucoma patients at the Massachusetts Eye and Ear Infirmary. Through the co-operation of the Society, this medical social service program continued for four years. The growth of attendance at the clinic during that period, together with the more diligent application of the patients themselves to their treatments, proved the value of medical social workers in eye hospitals. When, in April, 1932, the Society felt that it had

performed its part in demonstrating the value of this project, the Massachusetts Eye and Ear Infirmary retained the medical social eye worker as part of the permanent staff of the hospital.

Because of the interest aroused by the social service project in the Massachusetts Eye and Ear Infirmary, a course of training for medical social work in eye clinics is now established there. Eight of the students who took the course are filling positions in eye clinics. Another training center for medical social eye workers has been established in St. Louis. The publication of the semi-annual bulletin for medical social workers in eye clinics has been of great service in consolidating the interest of those particularly concerned in this work.

Saving Sight in Industry

Carrying on its campaign for wider knowledge of occupational eye hazards and means of eliminating these hazards, the Society last year supplied industrial posters and literature to universities and vocational schools, state labor departments, industrial journals, insurance companies and trade associations; and to ophthalmologists, teachers, safety engineers and others professionally concerned with industrial accident and health problems. The Society's co-operation with agencies concerned with the general safety movement resulted in the inclusion of a session on "The Eye" in the annual Greater New York Safety Conference.

Summary

In carrying out its program the Society utilized the press, the radio and the speaker's platform, as well as other media of public education. A large amount of publicity was secured in newspapers, magazines, trade journals and many other types of periodicals. Representatives visited 71 cities in 27 states and Hawaii, as well as Austria, Switzerland, Czechoslovakia, France, Germany and England. Prevention of blindness exhibits were loaned to 86 different communities during the year.

The SIGHT-SAVING REVIEW, a quarterly, which has a limited paid subscription list, is used as the Society's official organ. It was found advisable to cut the subscription price from three dollars to two dollars a year, in order that many of those who have been

subscribers can continue to receive the REVIEW on their reduced budgets. An increase in the number of subscribers, because of the reduction in price, is already indicated.

The *Sight-Saving Class Exchange* was published three times during the year and the *News Letter on Sight Conservation* but once, in order further to meet the needs for economy. Two numbers of the medical social service *Bulletin* were circularized, mainly to medical social workers. Other publications consisted of reprints of articles from the SIGHT-SAVING REVIEW which were considered especially appropriate for distribution among special groups.

The film on prevention of blindness which the Society helped to produce was borrowed by 20 communities for their sight conservation programs. In addition, the Society's slides were in constant use by speakers for their health talks.

More and more the Society is being called upon to act as a clearing house for all problems concerning sight conservation. Hundreds of letters are received, asking for information, and it has been necessary to develop a technique in handling the volume of inquiries. While it is impossible to give specific advice to individuals, other than may be contained in our literature, wherever the question is of such a nature as to suggest a particular reply, it is turned over for answering to a medical member of our directorate who volunteers his services. Frequently the Society is able to direct the inquirer to the local agencies best able to meet his needs.

The Society believes it has reached a high level of accomplishment in a depression year, when every economy was required. It is grateful for the continued interest of its supporters—both those contributing money and those participating in the work. Never has the need been so great as at the present time.

The Challenge of Ophthalmologic Problems—Do We Meet Them?

Philip A. Halper, M.D., F.A.C.S.

THE author points out that the inside of the eye gives the key to the diagnosis of various constitutional disorders

THE struggle for survival demands the complete co-ordination of all the faculties and especially the perfect functioning of the special sense organs. This is particularly true in the scheme of life below that of man, and were it not for the profound feelings of sympathy which are developed in man, humans with handicaps of sight and hearing, and other deformities, would fall by the wayside, as do their less fortunate friends in the animal kingdom.

Life to the individual with the capacity for finer appreciation of his environment means more than mere sustenance, and so we have schools, teachers and societies to develop the faculties of the handicapped so that they not only surmount the rigors of existence and attain material security, but also develop their other functioning senses enough to enjoy color, sound or other delights of their environment.

In so-called normal times, with all the assistance received from municipalities and organizations, the burdens of the handicapped are severe enough. Now, when the governments of the world are in the throes of ill health, threatened on all sides with calamitous changes, the handicapped child, the blind, the deafened, the crippled, are easily overlooked. Budgets are reduced, funds from subscriptions are unavailable, and so the first to suffer are those whose very existence depends on the generosity and sympathy of their fellow men. How quickly in our absorption with our own problems do we disregard the needs of the handicapped. When we look into their future it seems dark indeed. It is necessary for

physicians to prevent as much as possible those conditions which can be prevented. The public must be so educated in problems that lend themselves to correction that the individual from infancy to maturity will be given every opportunity to develop his senses sufficiently to take his place in the great struggle for survival, assisted by his greatest possessions, the special sense organs. Of all these, sight is the most vital.

There are many problems concerning defective vision, specific eye inflammations and blindness in the preschool age. These must be dealt with radically and quickly, for in some instances life itself is in the balance. In the period from five through puberty and adolescence the ocular disorders, though not an immediate menace to life, often assume great importance later on as far as social and vocational handicaps are concerned.

Ophthalmia Neonatorum

The prevention of ophthalmia neonatorum following the infant's safe journey through the birth canal brings to mind the name of the illustrious Credé. He gave to the world one of its greatest blessings when he introduced his prophylactic treatment against ophthalmia neonatorum: the instillation of one per cent silver nitrate, or other solutions of a similar nature, into the eyes of the newborn. Up to that time, in his own clinic in Leipzig, he had an average of over ten per cent of cases of gonorrheal ophthalmia in the whole number of newborns, and since a large percentage of infants were born outside the institutions and were affected with gonorrhea, the percentage of infections mounted in appalling numbers. That the prophylaxis which Credé introduced is effective is shown by the fact that after its introduction the figures in his own clinic dropped to one per cent and the same results were noted the world over.

Ophthalmia neonatorum makes its appearance about the third day after birth. As the child's head passes through the vaginal tract the eyelids are covered with secretions which penetrate quickly into the conjunctival sac. The lids become swollen and there is a profuse purulent discharge. Most of the infection is in the lining of the eyelid, the cornea, or covering of the eyeball, being quite resistant. Only when the cornea is injured does ulceration

develop, therefore treatment must be gently and carefully undertaken so as not to damage the cornea. The slightest abrasion of the latter with a cotton applicator, an irrigating tip or instrument, leads to disaster, and even under the strictest control and excellent care many of these eyes are lost. An important point to bear in mind is the fact that even though prophylactic treatment has been used the baby may subsequently develop gonorrheal ophthalmia a week or two after birth, because of contamination from an infected nurse or mother who is careless in caring for herself while harboring a Neisserian infection.

We occasionally see gonorrheal conjunctivitis in an adult. If the eye contamination occurs when the patient has his urethritis for the first time, the eye affection is quite malignant. However, if it occurs in the course of a recurrent urethritis, after the patient has developed some immunity to the disease, the eye complication is relatively benign, provided, of course, that the cornea remains uninjured. On virgin soil the virulence of a gonorrheal contamination is without equal.

There are several states in the Union in which the Credé prophylactic treatment is not compulsory, and the reason that gonorrheal blindness does not appear in greater numbers in those states is because the medical schools universally teach this very wise procedure.

Dacryostenosis—The Stricture or Narrowing of the Tear Duct

Another type of conjunctivitis, often found in a baby, is a very resistant form. In spite of the countless remedies used, the baby continues to have pus in the corners of the eyes, together with an abnormal amount of tears. In these cases one usually is dealing with a constricted tear duct and an infected tear sac. Especially is this true if the condition is unilateral. The tear duct is formed by an extension down from the sac and a continuation up from the nose. At a point where the two channels meet, the thin diaphragm, composed of several layers of cells, sometimes fails to break down and the naso-lacrimal duct remains obstructed. The tear sac soon becomes infected, causing a chronic conjunctivitis. By exerting pressure over the tear sac one can express a considerable amount of muco-pus through the entrance to the tear sac. At times pressure

over a filled sac may be sufficient to cause the thin diaphragm to give way and the duct becomes continuous. However, it is usually necessary to insert a lacrimal probe and break through the layer of cells which obstructs the canal, after which the troublesome condition quickly disappears.

Cataract

There is quite a variety of congenital cataracts, and the classification follows the location of the lens opacities. Complete cataracts seen at birth are due to developmental disturbances or to intra-uterine ocular inflammation. In the acquired forms, which are, as a rule, bilateral, there is a history of convulsions. These children show signs of tetany and rickets. Another type of cataract that one sees in children is due to injury, either from a perforating wound of the lens capsule or from a contusion of the eyeball. Cataracts that are complete, whether congenital or acquired, should be operated upon as early as possible, for we know that when the retina is unstimulated its development is arrested, with resultant poor vision. The operation of discission, or needling, can be performed in the first few months of life.

Avitaminosis—Vitamin Deficiency

Much has been written of late about vitamins, and the relationship that exists between dietary deficiencies and certain diseases is recognized. Without going too deeply into the problem, suffice it to say that a lack of vitamin A in the diet will produce certain eye changes. It is well known that the retina as well as the liver stores vitamin A. Since the newborn infant's liver contains little or no vitamin A, it is essential that the mother be given a generous supply of this vitamin during the prenatal and lactation periods. Vitamin A is derived from milk, butter, cream, egg yolk, cheese, liver, kidneys, cod liver oil, carrots, cabbage, spinach, tomato, bananas and turnip greens. The most common eye disorders due to deficiencies of vitamin A in the diet are nyctalopia, or night blindness, xerophthalmia, xerosis, and keratomalacia, all of which have to do with changes in the epithelial covering of the eyeball and lining of the para-ocular glands.

Tumors

Intra-ocular tumors are rare; they may be primary or they may have spread from another part of the body. The malignant growth found only in childhood, and usually under five years of age, is glioma—malignant tumor—of the retina. It may occur occasionally in successive children in the same family. We recognize three stages in the symptomatology of such tumors of the retina. In the first stage the inflammatory symptoms are absent and one sees a yellow reflex through the usually dilated pupil, which has been called amaurotic cat's eye—amaurotic because the eye is blind, and cat's eye because it shines in the dark. The second stage is inflammatory: the eye becomes irritated, painful, and there is an increase in tension. In the third stage the tumor has broken through the eyeball, finding its way along the optic nerve to the brain, and through the cornea, involving all the neighboring structures. The eye now becomes transformed into a large ulcerated painful mass which fills the whole orbit. Death occurs from intracranial involvement. Metastases are uncommon. In contrast with sarcoma, which spreads to other parts of the body early but remains localized for some time, glioma extends along the optic nerve to the brain rather early but metastasizes very late.

Squint—Cross-Eyes

To fix more firmly in one's mind the reason for certain procedures in the treatment of squint it will be profitable to review several of the fundamental factors pertaining to vision. In the lower forms of life the eyes are placed laterally and there is complete decussation of the optic nerves; central or detailed vision is lacking. Animals, therefore, rely on the other senses in order to survive, for having no binocular vision their sense of distance and depth perception, together with the clearness of the object, is missing. Besides, laterally projected vision makes for some protection since an animal can more readily see a moving object at its sides than if the eyes were in the frontal plane. Although lateral sight, as far as protection was concerned, became less necessary as man emerged from the jungle, his social and intellectual make-up, as civilization progressed, forced upon him the need for acute vision. Tilling the soil, making implements and secure habitation for protection from the elements

and beasts with which he was surrounded, and the development of a language with its signs and symbols, all participated in the evolution of the macula, which is the area of direct or acute vision. Man's visual needs grew as he continued upward in the social and intellectual order of things. With intelligent appreciation of his environment and of his development of the arts and culture, the evolution of the eye—laterally placed in the lower forms of life for protection, to the frontally placed human eye for acute vision, binocular in character, with its depth perception and finer differentiation—can be more critically evaluated. In the history of the race, macular or central vision is a relatively late acquisition.

The chief element in perfect binocular vision is fusion—the ability to fuse two corresponding retinal images into one—and our eyes are so placed in the frontal plane that rays of light entering them fall upon corresponding parts of each retina. Binocular vision is also a relatively late racial acquisition and is therefore a function that is easily upset. It is only when there is a great inequality of vision that squint appears, either in or out, according to whether the case is farsighted or nearsighted. It is believed that squint is due to a loss of the fusion faculty. When images are unlike and unfit for combination, the eyes adjust themselves by disregarding the poorer image and so one eye, namely, the better seeing eye, is used almost exclusively. The poorer eye deviates and squint therefore is a way out of a difficulty. This is accomplished by turning the poorer eye so that the image received by its macula in the new position is out of focus and blurred. Double sight, or diplopia, results when non-identical areas in each retina are stimulated and the child quickly learns to suppress the false image. Therefore, in the usual squint case, excepting paralytic or alternating squint, one eye has much less acute vision than the other. The squinting eye in hyperopes (farsighted) usually turns in, since the adductor muscles are much stronger than the abductors. In myopia (nearsightedness), however, the squint is divergent since the adductors are quite weak. Children as a rule are born farsighted, and when they are very farsighted, much accommodation must be brought into play in order to see clearly, especially for near vision. We know that convergence is so intimately associated with accommodation that these children who

have a non-stabile fusion faculty are unable to control the strained convergence in excessive accommodation and so the eyes cross over. In other words, the excessive accommodation causes an overbalance of the convergence. A word of caution here: one must not confuse squint with a seemingly turned-in eye in a child with a marked epicanthus—folding of the skin covering the inner angle of the slit between the eyelids.

The treatment of squint follows according to the type with which one has to deal. When one eye has poor vision, perhaps due to an abnormal amount of astigmatism, refraction under atropine cycloplegia with prescribing of glasses will often suffice. For the paralytic type of squint, prisms and surgery, after the lapse of at least a year, may be necessary. For the alternating type of squint with high hyperopia, refraction under atropine cycloplegia with prescribing of glasses is the proper procedure. This will correct the excessive accommodation and will release the strained convergence. Then, too, one must resort to fusion training with the stereoscope or amblyoscope. When glasses and orthoptic training fail to produce the necessary result, surgery is resorted to and its successes lie not only in the improvement of the appearance of the child, but in the fact that the eyes early are given an opportunity to function properly by developing the fusion.

> Emphasizing in the problem of squint the vital fact that the macula with its acute vision is never fully developed at birth but reaches its complete development as the child grows to about the age of seven years, one must appreciate the great need of having these little eyes examined and treated early, for the growing eye turned either in or out fails to develop its macula, fails to attain maximum vision, and the child has been robbed of its binocular acute vision with depth perception and appreciation. Infants tolerate glasses remarkably well and they can be prescribed for babies a year old.

Refraction

In the subject of refraction, the problems of eyestrain and poor vision present themselves. These symptoms may be due to farsightedness, nearsightedness or astigmatism. Farsighted people

and those with astigmatism have the symptoms of headache, eyestrain, etc., which come on, as a rule, about midday and are aggravated as the eyes are used. Not always does 20/20 vision mean normal vision, or emmetropia, for the patient may be accommodating even for distance. The myope sees poorly in the distance, has a weak accommodation mechanism and has no symptoms other than poor vision. Salient points to remember regarding the eye are as follows: (1) Children as a rule are born hyperopic. (2) The hyperopic eye tends to improve with advancing school age. (3) The myopic eye tends to grow worse with advancing school age. Both types should wear glasses—the farsighted individual to be relieved of symptoms and the nearsighted person to be given normal vision. The latter should always be fully corrected so as to prevent as much as possible the increasing myopia as the eyeball is growing. Myopia as a rule comes to a standstill when maturity or full growth is attained. The ophthalmologist's feelings regarding the wearing of glasses must be definite. The usual young hyperope should never be fully corrected and one should give only enough correction to relieve symptoms, just as one would prescribe any other form of medication. It should be a pleasure to take glasses away from a patient when they are not absolutely indicated even though the patient may have worn them for several years.

Interstitial Keratitis

During the school and adolescent years, one sees most of the cases of interstitial keratitis. The points to remember about the disease are as follows: (1) The etiology is, as a rule, inherited syphilis. (2) Though it affects the children of syphilitic parents, it does not pass to the next generation. (3) It usually affects both eyes, though there may be an interval of months or years between the involvement of one eye and the other. The eyes, as a rule, are attacked in succession rather than both at once. (4) Though the symptoms might be severe there is no corneal ulceration. (5) The prognosis is unfavorable regarding the duration; sometimes the disease drags on for months or years, but the ultimate outcome is, as a rule, favorable because in the greater number of cases good vision finally returns.

Relation of Eye to General Disorders

To the man who studies the inside of the eye faithfully, the ophthalmoscope gives the key to the diagnosis of various constitutional disorders and furnishes him with indications for treatment, besides enhancing his judgment regarding prognosis. In no other part of the body can the physician observe directly the internal anatomic structures which the eye presents, such as the nerves, blood vessels, media, etc., or the pathologic processes, such as hemorrhage, exudation, atrophy and edema. Since the eye is so sensitive to systemic disorders, it reflects directly the manifestations of active general inflammatory processes. In studying fundi, or the posterior part of the eye, one is impressed early with the many normal variations which one sees, and before one can correctly interpret a fundus picture, he must have considerable training in ophthalmoscopy. The more one examines fundi, the greater will be his ability to differentiate the normal from the abnormal. In order to pass judgment accurately, the pupil should be dilated so that the periphery of the fundus can be easily visible.

One reaps in proportion as one sows. The fruits which one gathers depend for their richness in flavor upon the soil which nurtures them, and on the tender care with which the wise gardener cultivates and protects his plants. In our attempts to help the child overcome a handicap and to prevent his becoming dependent upon a society that is forever changing, we find not only a positive satisfaction in our efforts but, in the end, the most satisfying fruits of our toil—his self-reliance and independence.

History and Development of Sight-Saving Classes in the United States*

Winifred Hathaway

CHILDREN with seriously defective vision may be changed from potential liabilities to the State into actual assets, when special school facilities and special teaching methods are provided for their education

INTO the foundation of any great building, whether it be an actual architectural structure, a progressive movement or a cause, are woven the thoughts and ideals of thinkers living in advance of their times. Those in the United States interested in the development of special educational advantages for partially seeing children are ever mindful of the fact that, away back in 1802, Franz von Gaheis of Austria not only recognized the need of special education for this group, but suggested definite ways in which such opportunity might be offered. As far as is known, he was the first to recognize that partially seeing children were quite as much misfits in schools for the blind as in those for the normally seeing. Later, Maddox and Bell, in England, came to the same realization and laid the foundation of the schools for myopes in that country, the actual establishment of which was due to James Kerr and Bishop Harman. In 1907 Levinson called attention to the necessity for special schools in Germany. So far as is known, the first classes were established in England in 1908. Strasbourg established classes in 1911.

It was from these myope schools that the United States received its direct inspiration. History repeats itself. Over a hundred years after the recognition by von Gaheis of the undesirability of

* Presented at the annual meeting of the International Association for Prevention of Blindness, Paris, November 19, 1932.

attempting to educate partially seeing children with those who were blind, Edward E. Allen, superintendent of Perkins Institution for the Blind, in the United States, came to the same conclusion through actual experience in his own school. On a visit to England, in 1909, he learned of the myope schools recently established there and, after studying their methods of carrying on the work, felt that he had found a solution for his own problem.

It took considerable time to convince educational authorities in the United States that special opportunities were necessary for partially seeing children, but due chiefly to Dr. Allen's efforts, a class was established in Boston, Massachusetts, in April, 1913. In September of that year, through the efforts of Mr. Robert B. Irwin, a second class was established in Cleveland, Ohio. From these two classes have developed the 409 classes in existence in the United States in September, 1932, representing 118 cities and 22 states.

These classes are now so generally accepted as a part of the educational system that the period of fundamental experiment may be said to be of the past. But it must always be borne in mind that every class, of whatever type, should be a laboratory out of which may evolve things of greater worth. In this sense, classes for partially seeing children will always be experimental; in the methods presented in this paper for administering and teaching such classes, there is no assumption that what has been decided upon as best for today's needs may be considered desirable to meet the changing attitude of tomorrow.

Nomenclature

Probably a phase in the attitude toward this type of education may be noted in the change of name. Since the classes in the United States from the beginning offered opportunity not only to myopes but to those suffering from other types of eye difficulties, the British appellation of "myope school" was inapplicable. The first classes were known as "classes for the partially blind." The term, however, was soon abandoned, since it laid emphasis on the negative side. A special effort was being made at that time for conservation of natural resources, hence the term "conservation" was in very general use. Thus the classes for partially seeing

children came to be known as "conservation of vision classes." This was later discarded in favor of a simpler term, "sight-saving classes." These classes have come to be recognized as a very important part of a national movement for conserving sight and preventing blindness, a movement quite separate from welfare work for the blind and also separate from the education of blind children.

Candidates for Sight-Saving Classes

The first step, for any community considering the establishment of sight-saving classes, is to determine which pupils are candidates and whether there are in the community enough children to warrant the establishment of a class. In the United States each state has the right to make its own educational laws; hence, so varied are the standards in different communities regarding the partially seeing child, that one eligible for a sight-saving class in one state may be ineligible in another. Many efforts have been made to reach common ground. This, however, is the more difficult because of the nature of the problem. Two children having the same degree of low visual acuity may react quite differently to visual impressions. One may be able, through experience, so to interpret his visual impressions—however indistinct these may be—that he can carry on his work in a sight-saving class; the other, through lack of such ability to interpret, may have to use the sense of touch as his chief avenue of educational approach.

The great stumbling block, however, is the question of myopia. So diverse are the opinions among ophthalmologists regarding this eye difficulty, that the educator is quite at a loss to know whether a child with myopia should or should not attend the sight-saving class. Since the decision of candidacy must, therefore, rest with the ophthalmologist and be considered an individual problem, the school physician and general practitioner are concerned to know which children should be routed to him for this final decision.

At the University of Chicago a meeting of ophthalmologists and educators was called to suggest guides for routing children to ophthalmologists. The following broad program was decided upon:

1. General statement: Children having a visual acuity of 20/70

(6/21) or less in the better eye after proper refraction. In addition, the following are recommended as potential candidates:

A. Children in elementary schools having four or more diopters of myopia.

B. Inactive, subsiding (or regressive) cases, such as interstitial or phlyctenular keratitis, optic neuritis, trachoma, etc., in which some irritation may be present, provided the approval of the attending physician is given.

2. All cases must be considered individually.

3. Any child who in the opinion of the ophthalmologist would benefit by assignment to a sight-saving class, subject to suggestion for treatment and training by such ophthalmologist, and the acceptance of the educational authorities having charge of such classes.

4. It is assumed that all the children assigned to sight-saving classes have average normal mentality.

Since children with a visual acuity of less than 20/200 (6/60) will, in all probability, be unable to use sight-saving class equipment, they are recommended for Braille work.

Proportion of Children Requiring the Advantages of a Sight-Saving Class

In the United States, the most conservative estimate of the proportion of children requiring the advantages of a sight-saving class is one in a thousand of the school population. However, in those states and cities that have most fully developed this type of education, the proportion more nearly approximates one in five hundred of the school population.

Ophthalmological Care

Educational authorities must necessarily take care of the routine placement of children with seriously defective vision. But it becomes the duty of the ophthalmologist not only to decide upon the candidacy of pupils and, if glasses are necessary, to check up on the prescription, but to see that records are prepared and that copies of these are made available to the educational authorities, so that teachers may be conversant with the type of eye difficulty

with which they may have to deal. Such records state the time of the next examination and make recommendations for the amount of close eye work. In many cases, in addition to the work already mentioned, ophthalmologists visit sight-saving classrooms from time to time to see the actual conditions under which the children are working and to assist the teacher in carrying out instructions.

In the United States ophthalmological care is provided in various ways: private physicians, ophthalmologists of the board of education or the board of health, and private agencies.

Administration

When candidates have been decided upon and the need for a class demonstrated, consideration is given to the selection of a school building. Since children eligible for sight-saving classes are social beings, great thought is given to see that they have the opportunity of mingling, as much as possible, with their normally seeing companions. It is felt that segregating them in a group by themselves without such opportunity for contact may add another handicap—that of social disability.

Hence, by the method pursued in 90 per cent of the classes in the United States, these children are placed in special sight-saving classrooms where, under the direction of a trained teacher who follows the recommendations of the ophthalmologist, they take all work requiring close use of the eyes. They join their normally seeing companions for oral work, rote singing, music appreciation, dramatic work, and other activities that are decided upon in a co-operative program.

The proportion of children needing this type of education is so small, in comparison with the general school population, that one class must, of necessity, serve a district or community. For this reason, children of several grades or standards will be found in the one group. It is essential for the success of the class that a school be selected having the same grades or standards as those represented in the sight-saving class. Since some children have to travel a great distance to reach the sight-saving class, the school selected is as centrally located as possible.

Lighting, Decoration of Room, and General Equipment

It is evident that if a modern building can be selected there will probably be little necessity for remodeling, since decoration and lighting of most of the new school buildings much more nearly approximate the ideal for normally seeing children than in the past. In this particular, what is ideal for normally seeing children is likewise ideal for the partially seeing.

Natural Lighting.—Unilateral natural lighting, to the left of the pupils, is desirable, with glass area at least one-fifth—preferably one-fourth—of the floor area. Since the best light comes from the top of the window, the glass area reaches within six inches of the ceiling and the bastions between windows are as narrow as possible to prevent shadows. In order to prevent glare in the eyes of the children and on blackboards, windows are not placed nearer to the blackboards than seven feet. Surroundings likely to cause glare, such as whitewashed buildings, glass roofs, etc., are avoided. In temperate latitudes, east or west, or northeast or northwest exposures are usually selected, since these give a maximum of light with a minimum of glare. The natural light is controlled by two buff colored, translucent shades, placed on rollers near the center of the window so that one may be pulled up and the other down. Shades are made wide enough to avoid streaks of light at the side, and care is taken to see that there is no unprotected space between the rollers.

Artificial Lighting.—In the early classes in the United States artificial lighting was thought to be unnecessary, since it was planned that only oral work would be undertaken on days when the natural light failed to give sufficient illumination for eye work. It was soon discovered, however, that children would use their eyes. In a mixed group of four or five grades or standards, subjects that could be presented orally to the younger children were of little interest to the older ones. Plans were developed, therefore, to make available artificial lighting meeting the same requirements as natural lighting—sufficient illumination for the type of work to be accomplished, well diffused, well distributed and without glare. By no means do all the sight-saving classes in the United States approximate this ideal.

Walls, Ceilings, Woodwork.—The color of walls is determined somewhat by the climate. In temperate zones, light buff walls with white or cream ceilings have proved most satisfactory; they are not only cheerful but, what is of great importance, have an excellent reflecting value. A neutral tone of woodwork is used. In order to reduce glare to a minimum, all surfaces—walls, woodwork and ceilings—are in flat finish.

Furniture.—Rooms are equipped with a teacher's desk and chair and with adjustable, comfortable, hygienic seats and desks that lift to an angle, all in dull finish. It will be necessary to add closets large enough to hold material of greater proportions than that used in regular grades, a long table and chairs for handwork, and, in classrooms intended for young children, kindergarten tables and chairs, a sand table for project work, and one or two easels.

Blackboards.—Blackboards are, as far as possible, of good slate and are kept in condition by frequent cleaning and by refinishing when necessary. Blackboards in three parts, each of which may be pushed up or down, make it possible for the pupils to keep work on a level with their eyes.

The arrangements thus far mentioned as necessary for sight-saving class pupils differ little from those for the normally seeing.

Reading Material.—The procedure in the education of partially seeing children in the United States had to be developed by the trial and error method. It was soon discovered that, given sight, no matter how poor this might be, children would read. In consequence, some method had to be devised by which they could read with the least possible eye fatigue.

For very young children there were in existence large reading charts with clear, distinct letters. But for children even slightly more advanced, no material was available. Handmade charts came into use, printed with rubber stamp letters of large size. This proved not only most laborious work for teachers and pupils, but it was found that, even when the printing was done with painstaking care, the ink was likely to be uneven, making the result more or less difficult to read. It was also found that although spacing between lines could be regulated by an attachment on the easel on which the printing was done, it was most difficult to keep the correct spacing between letters and words. Usually, one or

two children in the class proved able to do this laborious work better than others and, since too much of the teacher's time could not be devoted to the preparation of such material, if she were to accomplish all else required of her, this devolved upon the pupils who could do it best. For a short time this may have been good practice, but, after a period, there was no chance of further development, and the precision and length of time required to accomplish the work often caused a nervous physical strain.

There was also a second element to be considered. How were these children to know what to print? The teacher could not give the necessary time and attention to dictating the work, and, if material were prepared by her for the children to copy, there was the strain of reading the original.

The outcome was the development of books in large, clear type, on buff colored paper. The selection of paper took into account the findings of illuminating engineers that black on yellow is more legible than black on white. It also took into consideration the opinion of some ophthalmologists that yellow is the most fatiguing color because it leaves the longest retinal image. A compromise was made by using enough yellow to help in legibility, but not enough to cause eye fatigue.

At first a 36-point type was used (letters ½ inch in size), but, after considerable research, it was found that the eye span is too short to make this size the most advantageous, and special books for sight-saving class children were thereafter printed in 24-point type (letters ⅓ inch in size). There has not been, however, a sufficient amount of research on this subject and there is no certainty that this type is the one which will continue to be used in the future.

For children with such low static vision that they must hold their material close in order to be able to see it at all, a type that includes more in the eye span may eventually prove more satisfactory.

Writing Material.—Again, in the early days, individual seat blackboards were used with chalk, but no one could work long with any group of handicapped children without discovering that their special difficulty may be a symptom of the general physical condition. Much use of chalk at such a comparatively close range caused irritation to the throat, and chalk dust, unsanitary for

children in good general health, proved even more disastrous to those in poor physical condition. For seat work, therefore, large sized, buff colored paper and heavy-leaded pencils were substituted. Considerable work is still done on the large wall blackboards, since children get the benefit of change in position and eye focus and seem to be able to work at a greater distance from the board than when the boards are at the seats. Efforts were made to obtain a chalk in large size that would make a clear, heavy line. The chalk now used is Freart crayon about one inch in diameter.

In addition to general writing material, sight-saving classes in the United States are equipped with special typewriters, manufactured with a type as nearly as possible approximating that in their large type books. It must be emphasized that typewriting is never taught as a means of earning a living, but as a medium of written expression. Naturally the touch system is used, and just as soon as the mechanics of the machine are mastered, the children do their original work on the typewriter. This saves a very great deal of close eye use and, since the type is large enough and clear enough for the children to be able to see without eyestrain, they may use their eyes for short periods to read what they have typed and to make the necessary corrections.

The preparation of original work on the typewriter builds up exceedingly good eye habits and, at the same time, imbues the child with the idea of doing well the first time whatever he is undertaking, thus avoiding copying and recopying of material. It has been demonstrated that even quite young children can be taught to use the typewriter.

Division of Subjects

It has been stated that subjects requiring close use of the eyes are undertaken in the special class, and as many others as seem desirable with normally seeing children. In the first group of subjects are reading, writing and arithmetic. Two subjects not requiring close use of the eyes, handwork and typewriting, are included in this group—handwork because it is most difficult for teachers who do not understand the reactions of various eye difficulties to know what may prove harmful, and typewriting because this opportunity has not as yet been offered to normally

seeing children in regular grades or standards and hence must be treated as a special subject in the sight-saving classroom.

The so-called social subjects—geography, history, natural science, appreciation of music, rote singing, etc.—may be taken with the regular classes, but the preparation for these subjects, such as maps without detail, fulfillment of reading assignments, etc., is done by the sight-saving class teacher. However, the teacher's work in this particular is being considerably lessened by the co-operation of map makers in putting out maps in clear outline with no detail.

Illustrative Material

There seems to be no reason why children in sight-saving classes should be deprived of illustrative material. Large, clear pictures without detail, used with discretion, add greatly to the interest and development of the pupil.

Material for Motivated Handwork

The modern method of handwork for all groups is applied in the sight-saving class. Handwork must have a place in the educational program, and in the sight-saving class it must meet certain requirements: it must be an eye rest; it must be motivated; it must help to satisfy the creative instinct; it must arouse in the pupil so much interest that he will be glad to substitute it at home, as well as in school, for similar activities requiring close use of the eyes.

Educational Opportunities for Partially Seeing Children in Secondary Schools

In the United States secondary schools are divided into two groups—junior high schools and senior high schools. In the experimental days there was no thought of offering partially seeing children education in secondary schools. One reason was that methods of carrying on this work, before secondary education could be considered, had to be developed in the elementary school. The real reason, however, lay deeper. It was current opinion that, because of the seriously defective vision by which pupils in sight-saving classes were handicapped, they should not be educated

beyond the elementary school level. For some time, so tacit was the acceptance of this opinion, that higher education for these children was not even a moot question, except to the individual teacher who saw the need for some action, especially in the case of myopic children. Not only did these children seem to present greater intellectual ability than any other particular group, but the very fact that their eye condition prevented them from joining in the majority of outdoor games tended still further to make them studious, since they were likely to fall back upon the things they could do, however injurious these might or might not be to their sight.

It became evident to the thoughtful teacher that some children would continue their studies whether or not provisions were made for them, and that it would be much better to have them do so under correct conditions than under haphazard ones. Hence, many teachers took upon themselves the added burden and responsibility of keeping such children in their sight-saving classes after they had completed the work of the elementary school, preparing for them an enriched curriculum and, in some instances, giving them the actual work undertaken in junior and senior high schools. As the group needing this assistance grew larger, it became evident that better arrangements would have to be made for both pupils and teachers. The next logical step was to arrange for the education in junior high schools of graduates of elementary schools.

Much consideration was given to what arrangements would prove best. It was thought by some educational authorities that, since these children had from the time of their entrance into a sight-saving class been imbued with the idea of using the best method for taking care of their sight, they should be able to take the responsibility upon themselves in the junior high school. Others argued that children of junior high school age were altogether too young to assume such a burden of responsibility. The outcome was that, wherever possible, junior high school classes were established and placed under a trained teacher, the same methods being used as in the elementary school, except that the responsibility was gradually shifted from the teacher to the pupils.

In the junior high schools, the assignments in reading and for

general preparatory work are so much greater than in the elementary schools that it soon proved impossible for the teacher to read for each pupil those assignments not in large type. The plan of employing student readers was worked out and is being used in a number of places. According to this plan, student readers are selected from pupils in the regular grades who are doing the same work as the sight-saving class pupils. Instead of reading assignments to themselves, they read them aloud, either in study periods or by special arrangements after school hours. All work, however, is done in the school building under proper conditions, so that, when sight-saving class pupils and their readers leave, all preparation has been completed for both groups. Naturally, pupils well up in their subjects are selected as readers.

Eventually, a time came when graduates of sight-saving classes in junior high schools presented the problem of how they were to obtain the more advanced educational opportunities offered in senior high schools. To solve this new problem some cities established sight-saving classes in the senior high schools and conducted them in a manner similar to those in the junior high schools. But the majority of educators felt that it was time for these pupils, many of whom had had nine years of sight-saving class training, to assume the responsibilities that sooner or later would fall to their lot.

Hence, in the majority of cases, two high schools are selected in different parts of the city and graduates from junior high schools are allocated to them, entering these high schools as do all other high school pupils, except that an adviser—a supervisor, a sight-saving class teacher, or a senior—is appointed to help in the selection of courses, to make the necessary contacts with teachers, and to arrange for student readers. Since all freshmen are new to the building, it is necessary to select readers before the close of the previous school year; and usually those readers who have proved efficient in junior high school work are the ones selected.

By the time sight-saving class pupils enter senior high school, they should be so proficient in typewriting that they are able to prepare all their written work directly on this machine. A special portable typewriter has been designed for their use and many of them are permitted to take such typewriters into the lecture rooms

and make their notes directly on them. Another important innovation is that these students are permitted to take all their examinations directly on the typewriter, the questions being prepared beforehand in large type.

Provision for Partially Seeing Children in Vocational Schools

There will be found among sight-saving class pupils, as among those in regular grades, motor-minded children who must be given opportunities for vocational training. In America a few states are attempting to offer such training in a very limited way. Much research is necessary to find what occupations can be safely carried on and, at the same time, offer opportunity for employment.

Opportunities for Partially Seeing Children in Rural Communities

A scattered population makes it well-nigh impossible to gather together a sufficient number of children in any one rural district to warrant the establishment of a sight-saving class. A few states that have established classes in cities have occasionally made arrangements for rural children to be boarded in the nearest city having such classes.

In some instances, where transportation facilities are good, a community class has been established. A greater understanding of the sight-saving class movement has caused teachers in country schools, where there may be a partially seeing child, to reach out for such information and help as will enable them to give the child as much assistance as possible in carrying on the work in the rural school.

Methods of Administering, Supervising and Teaching Sight-Saving Classes

Administrative Direction.—In states where there is a state director of special education, the administrative direction centers in his department. Such administration concerns itself with the arrangements for obtaining and administering the budget and with laying down conditions under which state aid may be granted; certificating of teachers according to the provisions of the educational law of the state; inaugurating of training courses for new

teachers, to meet the state regulations; stimulating the formation of new classes throughout the state, particularly in those places where there are no local supervisors; establishing county classes and making other arrangements for the education of rural children needing this type of specialized education.

There are comparatively few cities that have a sufficient number of sight-saving classes to warrant the appointment of a supervisor who shall devote entire time to do this work. The majority of sight-saving classes are under the direction of a supervisor of all kinds of special classes. Unless such supervisors are specially trained to understand this particular type of education, the results are often unsatisfactory.

Some states have solved the problem of supervision by dividing their territory into two or more sections and appointing supervisors experienced in this work to travel from one city and class to another.

Teaching of Sight-Saving Classes.—There are no courses of study specially prepared for children in sight-saving classes; the object always kept in view is to conform as nearly as possible to the work undertaken in the regular grades. There are two reasons for this. These children are mentally as able to undertake the work as are normally seeing children. About four and one-half per cent of the pupils in sight-saving classes are able to return to regular grades and would be at a great disadvantage if they had been pursuing a different curriculum.

It is the adaptation of the work that is important. With the exception of a very few subjects, the regular school curriculum is followed and the same work is undertaken in the special class as in the regular grade. Where any change is made it is in the nature of a substitution or modification, rather than an omission. Thus, eye fatigue may occur in detailed drawing, but no child is deprived of the chance of illustrating his story by original work because he is not permitted to draw. He may accomplish the same result by free-hand cutting, by modeling, by a sand table project, or by mass painting. Likewise, no child is deprived of map work in history or geography just because he cannot use the maps provided for normal eyes. His map consists of an outline form, black on buff, or buff on black, or in colors sufficiently

contrasted to produce the result of clear outline. There are few, if any, names printed on this map; a plan is used by which special projects are carried out one at a time; a key to names may be given in large type on the opposite page.

In a few cities music scores are permitted if they are in large type but, in the majority of cases, lessons in music are confined to appreciation of music and rote singing. Where a child shows a decided talent for music—instrumental or vocal—special attention is given to him; and efforts are made to provide training under conditions suited to his special needs as a sight-saving class child.

Qualifications for Teachers of Sight-Saving Classes

Since the work of sight-saving classes is carried on as nearly as possible like that of regular grades, it is essential that teachers of these classes have the fundamental qualities and educational training of any good teacher. It is further essential that they undertake special training for the particular work of teaching a sight-saving class.

There are many reasons why a teacher contemplating specialized work, such as teaching a sight-saving class, should have considerable experience with the normal group. Just so far as it is possible, the education of the handicapped runs parallel to that of the normal. A teacher who does not carry into specialized work the normal attitude, or who becomes so engrossed in her own special work that she loses sight of the normal, is likely to add handicaps to those that already exist in her group.

In sight-saving classes, since several grades or standards may be and usually are represented, a teacher should have experience in teaching more than one, so that she will not have to make too many adaptations to new conditions all at one time. On the other hand, a teacher who remains too long in regular work before undertaking new lines of specialized education is likely to find it difficult to make adaptations to conditions differing from those to which she has become accustomed. Successful teaching in regular grades for at least three, preferably, five years should lay a good foundation and help the teacher to keep the normal viewpoint.

Special Courses of Training

By special training is meant training that bears a direct relationship to the work of teaching a sight-saving class. There is a diversity of opinion as to what this special training should include. Since it is often difficult for a teacher to take a full year, in addition to her fundamental training, to prepare for special work, several universities in the United States offer summer courses of six weeks' duration. This may appear a very short period in which to prepare for so important and arduous an undertaking, but a perusal of the work required shows that a real effort is made to give a good foundation.

The student is required to give her entire time for the six weeks' period. The work is divided into four parts: a course on the anatomy, physiology and hygiene of the eye; a course on administration and organization of sight-saving classes; a course on special methods of teaching sight-saving classes; and attendance for observation and practice teaching in a demonstration sight-saving class and at an eye clinic. Since an understanding of eye conditions is essential for carrying on this work successfully, the greatest emphasis is placed upon this section of the work. Only those teachers are eligible who meet the fundamental requirements, hence they are more or less familiar with the physiology of the eye, so that but a brief review is necessary.

Thirty lectures are given, in particular, on refractive errors and common eye diseases likely to be encountered in the sight-saving class. At least twenty hours are spent in an eye hospital or clinic where cases are seen and discussed with the ophthalmologist who conducts the clinic. The clinic usually affords the opportunity to see one or more operations, since the actual knowledge of how, for instance, a cataract may be removed can be gained much better by seeing the operation performed than by reading about it. Thirty lectures with discussions are given in the organization, administration and conduct of sight-saving classes. Thirty lectures with discussions are given in methods of teaching sight-saving classes. Students are required to spend thirty hours in the demonstration classroom to observe methods employed and the various reactions of the children; in addition, some practice teaching is done. Personal conferences with the students are held

by the instructor and further opportunities are offered for general discussion.

But just as education is a continuing process in all groups, so in sight-saving class work teachers are urged to take supplementary courses from time to time, to keep up with modern methods. In many instances, teachers are required to do this in order to obtain advances in salary.

Financing Sight-Saving Classes

The State makes education compulsory. Such a regulation can be enforced only when education is offered in a form that can be assimilated. Hence, it is only reasonable that the State assume its share in making education possible for all children. Fourteen of the United States have assumed this obligation. The provisions for giving financial aid vary according to the educational laws of the state. Such provisions may take the form of: (1) the appropriation of a per capita amount; (2) the appropriation of a general sum for the establishment and maintenance of classes, the distribution to be made by a specified educational department; (3) an appropriation to cover a part or all of the teacher's salary; (4) a combination of two of the above.

Of the various methods presented, the per capita method has proved the most successful, since, unless otherwise specified, the director in charge of administering the funds may use discretion. A class which is being established needs a large outlay for equipment, whereas a class that has already been equipped has to meet only current expenses, including some additional equipment, such as paper, pens, pencils, etc., and the replacement of worn-out material. It is evident that it is possible, under a per capita or even under a general appropriation, to provide for supervision—either whole or part-time, according to the needs—and to pay for student readers for junior or senior high school students.

Justification

It would seem almost unnecessary to have to justify the cost of the education of any child who is educable. Humanitarianism alone would seem a sufficient justification. Yet it must be remembered that the State is responsible to the taxpayers for the

use of public moneys and that, in consequence, the State tends to look upon all education as an investment that will pay justifiable dividends.

The object in educating partially seeing children is the same as in the education of any group—to prevent illiteracy and so to develop the innate powers of the individual that he will not become a liability but an asset of the greatest possible value to the State. This aspect of education is being demonstrated more and more by the method of individual instruction that is being emphasized in advanced school systems, by which a child is developed along the line for which he has the greatest ability. To give a partially seeing child an even chance with the normally seeing to become an asset to the State, it is necessary to provide for him the opportunity to overcome his handicap. In order to do this, such educational facilities must be put at his command as will permit him to develop along the line of his greatest strength, while his weakness, in so far as this is possible, is prevented from getting any worse.

It is obvious that such facilities cost more than those provided for the normally seeing. If, by providing them, the State is enabled to change potential liabilities into actual assets, no further justification is necessary.

Ultimate Aim

Underlying all efforts for the education of partially seeing children there should be a never ceasing work of doing everything possible to make special education unnecessary by:

1. Prenatal and natal care.
2. Greater attention to the eyes of the preschool child.
3. More extended medical service for school children.
4. Improvement in school plants to produce the best environmental conditions.
5. Co-operative effort—medical, educational and social—to eliminate the causative factors of eye difficulties.

Examination of the Eyes of Industrial Employees—Why and How?*

M. Davidson, M.D.

AN industrial plant employing more than 5,000 persons, if eye accidents occur in sufficient number, should have its own ophthalmologist. Annual eye examinations can be entrusted to him as part of his duties

IN considering safety in industry, defective vision as cause of accidents is not to be overlooked. It is only necessary to recall that the history of the safety movement in relation to defective eyes in industry begins with the discovery of color blindness as a major cause of railway and marine disasters. The expansion of motor vehicle driving later made it necessary to provide for the examination of the eyes of drivers. Aviation brought out the importance of depth perception, light sense, and indirect vision among aviators. We have taken these things for granted because the State has quite properly taken care of most of these safety measures by a system of licensing. The State in its physical examinations for some civil service positions also takes care of these safety requirements. In private non-regulated industry the menace of certain ocular defects is, of course, not so great; but the problems are of the same nature as those involved in the State regulations of transport services. While in our individualistic society the State is slow to step in, social, economic and medico-legal considerations have given the question of safety from ocular defects an increasing prominence even in non-regulated industries. Much has already been done along these lines and many pertinent data and practical information about the subject can be

* Presented at the Greater New York Safety Conference, New York City, during the session on "The Eye."

gleaned from two handbooks which I can highly recommend. One is, "The Functions of an Industrial Eye Clinic," published by the Metropolitan Life Insurance Company. The other is, "Medical Supervision and Service in Industry," published by the National Industrial Conference Board.

Related to the safety problem is the problem of contagious eye diseases, such as trachoma, which is quite prevalent in some parts of the country. A growing appreciation of the safety and public health aspects of industry is also indicated by regulations for the physical examination of food handlers.

The industrial efficiency argument for eye examination of employees is, of course, of interest to the employer primarily. While reasonable, in these days of industrial depression, technological unemployment, and technocratic gloom, it is rather an untimely subject. However desirable from the employers' standpoint, the worker and society in general may reasonably object to giving industry, and particularly some discriminating industries, the sole privilege of choosing and picking the cream of labor, and scrapping the remainder as unemployable or relegating them to the less fastidious industries. Some visual defectives are, moreover, the result of industrial accidents or occupational disease.

The third argument for examination, namely, vocational guidance, or the argument of ill health and fatigue, is in the interest of the worker and is preventive in nature. The importance of good vision for health has been amply preached by public health agencies and educational institutions, and the desirability of overhauling the human machine by periodic health examination is common sense and requires no emphasis.

A further argument for eye examination in industry is the medico-legal argument, growing out of the Workmen's Compensation Act, and of the examination of the eyes of injured employees, for compensation. If we bear in mind that 5 per cent of the total insurance companies' bill for compensation, or roughly two million dollars for the State of New York, is paid out for eye injuries, the medico-legal aspect is quite important. A great deal of unnecessary litigation, and an occasional incentive to fraud, could be eliminated if there were a record of the status of the visual apparatus of the employee at the start of his employment. The controversies

with which we are almost daily concerned in compensation examinations may be grouped into problems of old vs. new injuries; traumatic vs. non-traumatic conditions; and congenital vs. acquired conditions. These are not insuperable medical problems, but when lay referees have to decide these questions amidst conflicting expert medical opinions in an individual case, miscarriages of justice are likely to occur. Before going further into the phases of the subject, a review of the nature and prevalence of defective vision is not out of place. Loose statements, almost technocratic, about its extent abound in the literature and the range of defective vision is said to be from 34 to 75 per cent. In the first place, defective vision is a term embracing several conditions: distant vision, near vision, color vision, light sense, indirect vision, and depth perception and disease; conditions not always found combined. There is a widely varying frequency of the different conditions and they are of markedly unequal importance from the four angles as well as in relation to different industrial processes. The following two tables clearly indicate how loose the term "visual defectiveness" is in practice. The standardization of visual requirements recommended by the Committee of the Thirteenth International Congress of Ophthalmology, held in 1929, described in detail in a report of 148 pages, has been summarized in the following table by Dr. Verrey. In this table, *1* stands for perfect, *2* for good and *3* for fair. I have omitted the psycho-technic standards of reaction time, speed, sense of responsibility, as not our subject.

	Railway Engineers	Seamen	Public Motor Vehicle Drivers	Private Motor Vehicle Drivers	Aviators
Form Sense (Visual acuity)	2	1	2	2	1
Orientation Sense (Indirect Vision)	3	2	2	2	1
Light Sense	1	1	1	1	1
Color Sense	1	1	2	3	2
Sense of Depth (Binocular Single Vision)	2	1	1	2	1

The order of required visual perfection, with the psycho-technic standards included, is: aviators, public motor vehicle drivers, railway engineers, sailors, and private motor vehicle drivers.

For industries in general, aside from safety problems, the following table shows the different standards of visual needs, on the principle of 1/1000 for "visual" occupations, that is, the relation of size of object or part of object to the distance at which it is to be seen and corresponding to a visual acuity of 20/70.

Near vision is required by fine mechanics, printers, garment workers and office workers.

Distant vision is required mainly by transport workers.

Both distant and near vision are required by those who deal with moving objects or those who have to move around stationary objects (myopes are particularly handicapped for these occupations).

Depth perception is required by artists, draftsmen, etc.

Color vision is required by embroiderers, signal men, chemists.

Light sense is required by sailors, chauffeurs, miners, night watchmen, etc.

The standards already established by the State from the standpoint of safety and public health may be utilized as a guide by private industry. It should be noted, however, that the standards established by law in this respect are far from high and are not uniform, and that the international committee referred to, which is to report at the next Congress to be held in April of this year at Madrid, has been engaged in standardization of methods of testing the eyes and of the minimum requirements for various public services where the question of safety is involved. That there is need for standardization was proved only three years ago, when the methods of testing marine officers for color blindness employed by the United States Public Health Service proved inadequate to the extent of admitting over 15 per cent of color blind persons, and had to be replaced by more modern and more precise methods. There is also an increasing demand for incorporating tests for color vision for taxi drivers.

Popular figures referring to prevalence of defective vision are misleading. We read in the Industrial Health Series booklet of the Metropolitan Life Insurance Company, otherwise admirable,

that, without taking the severity of defects into account, there are from 10.6 per cent to 95 per cent of people with defective vision, depending on age and occupation. The National Industrial Conference Board, moreover, found rejections by industry for physical defects ranging from 1 to 40 per cent, with hernias and defective vision in the lead. Dr. Shaffer of the Bethlehem Steel Company reported at the 1928 Annual Conference of the National Society for the Prevention of Blindness that 46 per cent of all rejections were because of defective vision.

If we consider that the taxi operator has the most responsible of jobs next to that of the aviator, from the safety point of view, in accordance with the opinion of the International Committee quoted, and that the New York Police Department requires a vision of 20/40 in either eye, and records only about 2 per cent rejection for defective vision among applicants for taxi-cab licenses, we must describe the figures for industry quoted above as out of proportion to the real situation—even allowing for the greater thoroughness of the examinations by industry and for the selectivity of the group that applies for taxi licenses. Collins, whose classical studies are often wrongly quoted, finds that among children from six to sixteen, 10 per cent had rather poor vision (20/40 in one or both eyes) and that 2 per cent were color blind and 1 per cent cross-eyed; and among industrial male white workers, 25.8 per cent had 20/40 and less vision. McAuliff found 22.8 per cent of defective vision from all causes among industrial workers, but only 6 per cent with monocular blindness from all causes, and only 2.26 per cent (113) due to errors of refraction.

If we bear in mind that many of these had better or normal vision in the other eye, the probability is that 4 to 6 per cent is the maximum that comes under the most rigidly applied definition of defective vision among adults. This is borne out by our study of 1,000 compensation cases, which contain as many as 47.1 per cent of injured eyes with sequels, and many more without sequels, and 24 per cent awards for permanent eye injuries. This shows only 20.2 per cent of persons with vision of 20/40 and less in one eye, if we discount simulants and enucleated eyes. The fact, however, that, with exception of 0.2 per cent of bilateral industrial blindness, all are returned eventually to industry, is the most eloquent argu-

ment against popular misconception of the magnitude of the problem. As to the effect of defective vision on accidents to eyes—it must be small, since eye injuries are predominantly from "flying" particles or liquids which good vision alone cannot control.

From the analysis of the problem of defective vision in industry, and the different bases back of the several arguments for eye examination, there grow out logically the procedure and the "how." It can be seen that the major problem is that of safety. This does not differ in its nature from that already provided for in the regulation, by the State, of public services involving the transportation of passengers, but is inherently of lesser and varying importance in private industry. In so far as it is a problem, the standard for public services may be taken as a guide in working out standards for industry, remembering that the term "defective vision," from the standpoint of safety, is not synonymous with low visual acuity correctible by glasses, but is mainly concerned with defects not susceptible of correction by glasses—defective color vision, depth perception, indirect vision and light sense. Such an examination, to make it worth while, should be done by ophthalmologists. It obviously should be a pre-employment examination, free and administered by a public agency. It need not be more frequent than at intervals of three to five years. It may be considered an extension—to adults in industry—of the eye examination which school children receive, administered by the board of education's staff of ophthalmologists. This work might be done by eye examiners attached to public employment agencies, or by the existing Labor Department medical staffs, or by the Motor Vehicle Licensing Bureau staff of medical men.

The medico-legal problems involved in the administration of the Workmen's Compensation Law, as far as the eyes are concerned, could be taken care of at the same time by recording findings and furnishing a copy to the examinee for future use in applying for employment and in controversies in compensation. It is not so ambitious and expensive a plan as it sounds at first. This type of examination requires about eight minutes. An ophthalmologist trained in this work can take care of 50 persons a day, or by examining 10,000 persons yearly of a population of from 30,000 to 50,000 persons. His examination should be limited to the safety

problems and to medico-legal purposes, and his functions should not include prescribing glasses or treatment, industrial selection, or vocational guidance. The data he gathers would also constitute a valuable contribution to science and industry.

Vocational guidance and industrial selection or fitness are problems in periodic health examination and should be the task of the plant medical service after employment. A distinction should be maintained between the purposes of vocational guidance in the interest of the worker and those of industrial fitness for the benefit of the employer. The periodic health examination of employees should help in discovering occupational eye diseases, some of which we know and which are recognized by law as compensable, such as—miners' nystagmus, glassblowers' cataract and the toxic amblyopias from wood alcohol, carbon bisulphide, etc. An occupational disease so far not recognized by law but encountered often enough in the course of examination for compensation to deserve attention is, for want of a better name, what I would call "stone cutters' cornea," consisting of numerous fine dot-like opacities on the cornea, of which the worker himself is not aware. These dot-like opacities look like the marks left on the protective goggles which the workers are supposed to wear, but frequently do not. After years of exposure to stone-cutting and marble-cutting, impaired vision, to a considerable extent, results, but compensation cannot be secured because the impairment is not the result of a single accident. Related to this condition is the anesthesia of the cornea, recently discovered to be quite prevalent in Soviet Russia. It occurs among workers exposed to an atmosphere laden with sharp metal dust. It is probably not uncommon here, and accounts for failure on the part of the worker to notice and report the presence of a foreign body for many days, until it has formed an ulcer. It also accounts for occasional controversies as to the presence of an accident.

Plants employing over 5,000 persons and where eye accidents occur in sufficient number, should have an ophthalmologist, and the annual periodic eye examination could be entrusted to him as part of his duties. Smaller plants could have part-time eye men. Under any circumstance, eye examinations should not be the work of anybody but eye specialists. They cost no more to employ than

optometrists and can do the work of treating and examining, as well as discovering the many general diseases, such as diabetes, nephritis and central nervous system disturbances, which eye examinations disclose.

Summary

1. The arguments for eye examination of industrial employees are derived from four fundamentally different motives: safety; medico-legal problems in workmen's compensation; industrial selection; and vocational guidance. The first two arguments are in the domain of public concern and public health—the last two are in the interest of industry and of the worker respectively.

2. Contrary to prevalent conceptions, the problems involved concern only about 4 to 6 per cent of the working population, and the term, "defective vision," as applied to them, is too broad. It should be specific as to the different elements in vision—visual acuity, color vision, light sense, indirect vision and depth perception, and their varying importance from the different angles of approach.

3. The main problems are safety and compensation for eye injuries. The former is partly solved by the State-controlled examination of all transport employees; by railway, marine, aviation and motor vehicle licensing provisions; and its standards are being now established by an international congress. There should be a pre-employment examination by State agencies for both purposes, at intervals of three to five years.

4. For industrial selection, vocational guidance and elimination of occupational diseases, a different procedure in standardization, on the basis of the special requirements for types of occupation, should be worked out, and should be the task of annual periodic eye examinations by plant medical services.

5. Eye examinations for the purposes mentioned should be the work of ophthalmologists, or "eye physicians," exclusively.

Social Service With Eye Patients*

Eleanor P. Brown

MEDICAL social workers are proving their usefulness in eye hospitals and clinics

IN accepting an invitation to present a paper on social service with eye patients, certain doubts naturally arose in my mind as to the value of anything I might contribute to a group of workers who have so much greater knowledge about medical social service. How could I profess to speak to authorities in this field who in their hospital work are coming in constant touch with persons suffering from eye difficulties of one kind or another and are helping at first hand to solve many complicated problems?

And then I began looking through reports coming into the Society's office from hospital social workers in various places. A case of phlyctenular keratitis under care of the family relief society could respond to treatment only after the need for improved diet was explained to the family visitor and the significance of proper nourishment and hygiene in controlling the disease was understood by visitor and relatives alike. A child with congenital cataract and classified as blind was, through operative procedure and case handling over a long period of time, fitted for education in a sight-saving class. Complete medical care was required in this instance and, as various disabilities were removed, manifestations of nervousness diminished. A general rehabilitation of the patient brought about an entire change in outlook—an eagerness to progress in a normal life with sighted people; one who would have continued to be a drain on the community has become a member of society ready to take his proper place in the world.

* Presented at the Regional Conference of the American Association of Hospital Social Workers, New Orleans, Louisiana, February 12, 1933.

Then there is the girl with interstitial keratitis, for whom a carefully developed plan of co-operation with skin clinic, family, and private physician in the home town, made possible a steady improvement in vision; there is the case of a baby with an acute eye infection, in which convincing the parents of the need for hospitalization and enlistment of the nursing organization for follow-up care prevented total blindness; there is the child with corneal ulcer for whom the all important hygienic and dietary regulations to accompany the medical care could be secured only through skillful and painstaking work with the family and friends; there is the woman with hearing destroyed by infantile paralysis, who failed to realize the importance of operation and continued medical attention when a diagnosis of glaucoma had been made; winning her confidence and the family's co-operation saved sight that in this instance was of double value because of the patient's deafness.

With these and many similar examples before one, hospital social service cannot seem foreign to an interest in the prevention of blindness; nor can we fail to believe that in the hands of hospital social workers lies a power which is great and, as yet, scarcely tapped, to reduce the toll of visual handicaps. A gradual increase is noted in the number of eye hospitals and clinics utilizing social workers, thus providing a vital accompaniment to the doctors' professional skill. May I speak briefly of the Society's part in the promotion of such service, based on our increasing belief in its value?

On April 1, 1928, we entered into active co-operation with the Massachusetts Eye and Ear Infirmary in Boston, by making available in the social service department a special worker for handling glaucoma cases. Dr. George S. Derby, chief of the eye department and a member of the National Society's Board, was particularly interested in glaucoma as a disease capable of control if brought under early medical treatment and continued supervision; intensive work along this line was undertaken at the Infirmary to demonstrate what might be accomplished by a careful and complete method of following up glaucoma patients. It is interesting to turn to the first report of this study and then to the final reporting, made shortly before the Society's withdrawal

from the demonstration on April 30, 1932, when the entire salary of the worker was put on the payroll of the Infirmary to continue the special work as a regular staff contribution. In the summer of 1928, 365 patients were registered in the follow-up files, which contained a fairly complete accounting of all glaucoma patients treated at the Infirmary, since medical opinion in general regards the disease as one rarely cured, though frequently checked in progress. Efforts to trace the 365 resulted in finding that 17 had died, 9 had applied elsewhere for treatment, 2 had left the country, 6 were bedridden and the whereabouts of 34 could not be ascertained; the remaining 297 were kept on the books for supervision and treatment. At the end of 1931, 823 patients were on the follow-up list, an increase indicating not only a much more thorough control of the disease incidence, but also a more general recognition and acceptance by the public of the care offered.

I shall not continue to quote figures, but shall touch on one or two points in the Boston demonstration that, to my mind, stand out with special significance. It has been shown that assignment of a worker to this group made possible the routine follow-up of all glaucoma patients, and that a systematic plan of clinic procedure enabling each patient to have individual and sympathetic consideration could be put through. Facts which might have significance in the study of cause and evaluation of treatment were made available through acquaintance with living conditions and a checking up on the use of medicine prescribed and the following of medical recommendations. The social worker's value as interpreter is particularly great with glaucoma sufferers, who become easily discouraged under the long time treatment; her skill as a case worker may be of greatest assistance to these patients, for whom relief of anxiety and of home complications is vital.

As to whether any special technique in handling eye patients is demanded, distinct from that used with other types of patients, I cannot say. I believe that a real knowledge of case work methods is essential to successful practice, as is ability to capitalize on all one's resources; also an ability to adapt oneself to a position calling, perhaps, for some tactics different from those practiced in other departments. Ophthalmologists have not used medical social

workers to a very great degree; the newcomers must prove their value. I know that without an understanding of the eye and its functions as a part of the body, without an understanding of eye diseases and defects in their relation to cure and disability, the medical social worker would be able to do only half a job.

These thoughts led the Society in April, 1931, to participate in the establishment of an experimental training course to be carried by the Social Service Department at Massachusetts Eye and Ear Infirmary. Scholarships were granted to three workers, and since then two other courses have been given with a total of nine students of varied experience and qualifications being prepared in this specialized way for eye service. Another two are now in training at McMillan Hospital, St. Louis, where the teaching schedule is carried in both the Washington University Hospitals and the George Warren Brown Department of Social Work. Frankly, this training is still in an experimental stage, both from the standpoint of content and student personnel. The Society has not ventured even in this initial work, however, to proceed without the thought and advice of hospital social workers themselves, and members of the American Association experienced in educational methods, in administration and in advancement of the medical social program from many angles, have been called into consultation and have given freely of their knowledge.

Beginning in December, 1931, funds were appropriated for use in demonstrating the sight-saving value of social service with eye patients. Because of a natural limitation in the amount available, we could arrange for only three centers where, for a demonstration period, the Society would share in meeting the salaries of trained workers. In making selection, the location, medical standing and quality of the hospital's social work, if any, were taken into consideration, not to mention a desire on the part of the medical staff and the administration to carry the service during and after the National Society's participation. Wills Hospital, Philadelphia, McMillan Hospital, St. Louis, and Charity Hospital, New Orleans, were chosen. The Society has assumed no administrative responsibility, although it maintains a certain amount of supervision over the work through a monthly reporting from the demonstration workers. In these reports, as well as in occasional reports sent us

by medical social eye workers elsewhere, data that in time may have medical as well as social value are being accumulated.

We in a national office have always to guard against the dangers of making sweeping statements as to how things should be done in a given situation, and of failing to see that situation in its individual setting, with its own unique problems. It is very easy to sit back and state broadly that every eye hospital and clinic should have its social worker as an adjunct to the medical staff, for in general that is what we believe. But it is a generalization, and must be recognized as such. The volume of eye service, size of budget, medical viewpoint, methods of administration, local understanding and affiliations, teaching opportunities, all need to be considered in determining the wisdom of installing a special eye worker. Let us not overlook, though, the very real opportunity through such worker actually to save sight, to stimulate medical understanding, to take part more thoroughly in community development, to progress, however haltingly, towards the ideal of perfect service.

Editorials

A Quarter of a Century of Saving Sight, 1908–1933

TWENTY-FIVE years ago a small group of public-spirited men and women met at the home of Miss Louisa Lee Schuyler, who had just learned that one of the major causes of blindness, ophthalmia neonatorum, could be prevented if a simple precaution were taken with the eyes at the time of birth. Seated in the mellow surroundings, discussing ways and means of reaching the public with this problem, these gentlefolk could not have dreamed that their benevolent scheming would evolve into a world-wide movement to stamp out all blindness.

At that time the immediate problem was the eradication of ophthalmia neonatorum. For that purpose they organized the New York State Committee for the Prevention of Blindness, which later became the National Society. Since then, many new terms have become familiar to prevention of blindness workers—sight-saving classes, preschool vision testing, eye protection in industry, medical social eye work.

On this anniversary we may happily say that ophthalmia neonatorum as a cause of blindness has dropped 73 per cent. Sight-saving classes have increased from two in 1913 to 413 in 1932. Preschool eye testing is being introduced all over the United States. Many states have workmen's compensation laws which are designed to enforce safety in industry. The membership of a few individuals who comprised the State Committee in 1908 has grown to 30,000, representing the whole country. From this New York State Committee has developed not only the National Society, but also the International Association for Prevention of Blindness, which has its office in Paris.

In the satisfaction of our achievements, however, we must not overlook what remains to be accomplished. More than 4,500 sight-saving classes are still needed in the United States. Only one in 25 preschool children has the benefit of vision testing. Scores of children suffer eye injuries annually as the result of

unsupervised play with dangerous firearms and fireworks. Trachoma still remains, for the most part, a baffling problem. Eye accidents in industry are one of the most serious causes of blindness. Much remains to be done to reduce the incidence of impaired vision and blindness which occur chiefly in middle life and later. Medical social eye work is still in its infancy.

As long as there is any blindness from any preventable cause whatsoever, the National Society continues to feel the same challenge which its founders met so courageously twenty-five years ago.

Sight-Saving Training Courses for Teachers

The need of special education for partially seeing children was announced by Franz von Gaheis as early as 1802, but more than a century passed before his suggestion bore fruit in the United States, with the establishment of two sight-saving classes in 1913. Yet, only twenty years later, there are 413 such classes. The experimental stage is over—special education for the visually handicapped has proved itself.

Today we are faced with the need for national economy. Individual states, as well as the nation, are balancing their budgets and cutting appropriations in education, along with their other economies. The number of sight-saving classes may not continue at present to increase in the same proportion, but the spirit of expansion of facilities for special education, as brought out so clearly in the White House Conference, will not languish. Ten times the present number of sight-saving classes are required to take care of all the children needing this special type of education. When resumption of growth comes—as it inevitably must—the most pressing need will be for trained teachers and supervisors. To those who look forward to that time, the summer sessions for training in sight-saving class work offer an opportunity for real service in education, as well as for professional advancement.

Note and Comment

Dr. Lapp Heads Rehabilitation Association.—During the conference of the National Rehabilitation Association in Chicago, in October, a step toward the nation-wide development of resources for the reorienting of the handicapped was taken in the selection of Dr. John A. Lapp as the director of the Association. His broad experience in social work and health projects and his wide connections with educational, social and health organizations all over the country, as well as his inspiring outlook on the problem of rehabilitating the maimed and the handicapped, give promise of real accomplishment in this field.

Prevention of Blindness Procedure Checked in Rhode Island.—The Rhode Island Public Health Commission has recently adopted a standard form of birth certificate, and one of the questions to be filled out is: "Was a prophylactic for ophthalmia neonatorum used? . . . If so, what? . . ." It is felt that the inclusion of this question will go far towards educating doctors and midwives in the importance of using a prophylactic promptly in order to prevent any cases of babies' sore eyes.

Sight Conservation Celebrated in Japan.—Under the auspices of the Central Society for the Welfare of the Blind, Japan observed its second annual "eyesight conservation day." Lectures, motion pictures and slides on sight conservation, and clinics for school children and adults marked the celebration of a determination to reduce preventable blindness through popular education.

Conservation Essential in Industrial Recovery.—Now, more than ever, it is necessary to watch the little costs that add to the general expense of plant operation. Standing high in the list of small things that increase overhead are accidents. Although the direct cost of accidents to industry is, conservatively, but one per cent of the payroll, the attendant costs of accidents raise the percentage from 1.5 to 25 per cent, according to figures of Mr. H. W. Heinrich, in the December issue of *Safety Engineering*. All meas-

ures that tend to decrease accidents—more consistent and persistent use of safety devices, better illumination, and the fullest cooperation between employer and workers—will benefit both groups, by eliminating preventable accidents and lowering costs of production.

Summer Courses for Teachers and Supervisors of Sight-Saving Classes.—Arrangements have been completed to offer courses of training at Western Reserve University, the University of Chicago and Columbia University during the coming summer sessions. The course at Western Reserve University, Cleveland, Ohio, will be given from June 19 through July 28. Application for registration must be mailed to the registrar before June 1. Registration is on June 19. The Chicago course will open June 26 and continue through August 3. This course will be limited to 16 students. The Columbia course will open July 10 and continue through August 18. A course will probably be offered at State Teachers College, Buffalo, N. Y., but arrangements have not yet been made. Details regarding these courses will be given in the next issue of the REVIEW.

Eyestrain Reflection of Health in Tropics.—To those whose eyes are exposed to the constant and harsh glare of desert or sea, particularly in the tropics, a note by Dr. A. F. MacCallan in the *Lancet* is of interest. He reports that focal infection in the teeth or tonsils, or any reduced state of health, increases visual discomfort in the glaring countries. He advises that all minor health obstacles be corrected, that the eyes be adequately refracted, and that dimming glasses may be used for eye comfort.

Mary Dranga Campbell Joins Brooklyn Charities' Staff.—Recognized as one of America's outstanding workers for the blind, Mrs. Mary Dranga Campbell, recently executive director of the Missouri Commission for the Blind, has been appointed director of work for the handicapped (blind and crippled) under the Brooklyn Bureau of Charities.

Prevention of Blindness, a Farsighted Economy.—"We build palatial hospitals at the foot of the precipice all ready for the

casualties, and never take the trouble to put up a warning notice or a railing around the top," said Dr. G. W. N. Joseph, at the quarterly meeting of the Northern Counties Association for the Blind in Sunderland, England. The amount of money being spent for the care and training of the blind is increasing yearly, and in prevention of blindness lies the only hope of curtailing this tremendous and often unnecessary expense. Dr. Joseph pleaded for thorough certification of the blind as a means to insure that all blind persons, and only blind persons, receive benefits, and to assist, through ascertainment of causes, in preventing blindness in the future. Many causes of blindness, which become apparent through investigation of those already blind, may be eliminated, and the major causes of blindness ascertained. The resolution providing for certification of blindness through ophthalmic examination was put to the meeting and adopted unanimously.

Increased Lighting Investment Repaid Tenfold.—At a time when educational expenditures are being viewed with an eye to cutting, it is interesting to note that the Alabama Power Company recently conducted an experiment demonstrating the wisdom of spending a penny to save a pound. Improved lighting in a schoolroom cost $44 more than the usual amount, but class failures in this room fell more than 60 per cent, saving the educational board (and the taxpayers) $420, the estimated cost of repeaters in this grade.

Course on Eye Conditions.—For the benefit of school nurses, sight-saving class teachers, public health nurses and social workers, New York University, in co-operation with the State Department of Social Welfare, is offering a course on "A Survey of Eye Conditions," February 7 to May 23, every Tuesday evening from seven until nine, at the Medical College Building, 338 East 26 Street, New York City. Miss Dorothy Behner directs the course with the co-operation of prominent ophthalmologists.

Sight—the Motoring Sense.—Certainly no blind person would attempt to drive a car, yet many of the drivers of motor cars have visual handicaps nearly as great. Lack of full field of vision, tendency to night-blindness, hypersensitivity to glare, diplopia,

early visual fatigue, all of these difficulties are as dangerous to drivers as might be complete blindness. Dr. Alvhh R. Lauer, who writes about the eyes behind the windshield, in the *National Safety News* for November, 1932, urges that state traffic bureaus set up for drivers minimum standards of vision compatible with safety.

The American Standards Association has undertaken a study of motor cars with the view to reducing accidents. They, too, stress the need of the motorist to see and be seen, but from the standpoint of car visibility. Cars should be constructed so as to permit the driver easy visibility ahead and to the side, without necessitating his moving his head about for better vision. Clear windshields are needed, as are headlights that pick out objects distinctly without causing glare in the eyes of oncoming motorists.

May Day—Mothers and Babies First.—The slogan adopted for 1933's Child Health Day, "Mothers and Babies First," reminds those concerned with the prevention of blindness of first steps to be taken to prevent blindness in future generations: prenatal care and the routine employment of prophylaxis to guard against babies' sore eyes. That the figures for the past year for admissions to schools for the blind because of ophthalmia neonatorum have risen slightly, instead of falling as they have heretofore, is sinister warning of the need to continue the campaign for this simple safeguard.

Follow-Up Service in Eye Cases.—If all the money in so-called "eye-glass funds" could be converted into salaries for experienced eye social workers, the ratio of prevention of blindness to the sum of money now being expended would be increased to greater proportions, was the opinion of Ruth B. McCoy, R.N., director of prevention of blindness of the New York State Commission for the Blind, expressed at a recent meeting of the New York City Welfare Council Committee on Development of Social Service in Eye Clinics. The social worker's grasp of all factors involved in the problem of a person needing eye care may help him to adjust his individual problems, often arising out of his visual defect, and show him, or his parents, in the case of children, how the expense

of glasses may be met, how to care for the glasses, and how to conserve his vision.

Sight-Saving Classes a World-Wide Project.—At the annual meeting of the International Association for Prevention of Blindness, held in Paris, November 19, the organization and teaching of classes for the "weak-sighted" were the principal topics of discussion. Papers on methods of instruction and selection of pupils were presented by Prof. Pierre Villey (France), Dr. N. Bishop Harman (England), Mrs. Winifred Hathaway (United States of America), Prof. Dr. Martin Bartels (Germany), Dr. Auguste Dufours (Switzerland), and Dr. M. E. Redslob (France), stressing the local and international problems involved in this type of special education.

Goggles—$2,000 per Pair.—Pennsylvania's Department of Highways puts a valuation of $2,000 a pair on four pairs of goggles recently exhibited in that department. Each pair of goggles had saved the eyes of its wearer, saving the state about $2,000 in compensation costs; the value of these same goggles to their wearers cannot be measured in money.

Miners' Nystagmus Again Studied in England.—The third report of the Miners' Nystagmus Committee finds again that the primary cause of nystagmus is the low illumination under which miners in general work; in several mines where the defective lighting system has been replaced with a more efficient system, the incidence of the disease has fallen off sufficiently to prove this theory. The best lighting comes from the use of electric cap lamps, or from electric hand lamps, with as much as 4.5 candle power. The Committee recommends that practical treatment of the disease consist of elimination of a hopeless dependence on compensation by the provision of opportunities for work of some kind, the end being complete restoration to full work underground, under conditions of proper illumination, even if this has to be preceded by a period of work in daylight.

Institute of Ophthalmology Opened.—With the purpose of promoting the scientific study of diseases affecting the eye, the new institute of ophthalmology, the gift of Mr. Edward S. Hark-

ness, at the Presbyterian Hospital was opened on January 16. Emphasis in this center will be laid upon the best modern clinic and hospital care of patients affected with diseases pertaining to the eye.

Cost of Compensation.—Of the total cases eligible for compensation in New York State, according to the special bulletin on *Cost of Compensation, Two Years, 1930 and 1931*, issued by the Department of Labor, three-quarters are for temporary compensation. Next in volume is the compensation paid for permanent partial disability, i.e., the loss of an eye, finger, hand, etc. The total cost of permanent partial disability is nearly twice as great as the entire cost of temporary disabilities. Injuries to the eyes with total loss of useful vision of both eyes were found to be the most frequent cause of permanent total disability, next to the skull and back injuries, rendering the workman incapable of resuming work. Tables of injuries for which compensation of any sort was awarded, and statistics showing the costs of such compensation, are a poignant reminder of the importance of practical accident prevention.

New Apparatus for Testing Field of Vision.—The need for accurate tests of the field of vision, particularly for persons applying for blind relief, has created a hand campimeter, described and illustrated in the *British Journal of Ophthalmology* for December, 1932. The apparatus consists of three concentric circular rings of wire; the innermost, when held twenty inches from the patient's face, delimits a field of 10 degrees. The simple device shows not only the field of vision, but the sections of the field which are limited.

Ohio Fights Babies' Sore Eyes.—Nursing service for a period of two weeks is provided by the State of Ohio for cases of ophthalmia occurring in infants two weeks old or younger, when such need is reported by the local commissioner of health. Of the 947 cases of ophthalmia occurring in the first two weeks of life, reported to the department of health, in a year's period, only 23 proved to be of gonorrheal origin. Nursing service provided for these cases at state expense averaged $211 per patient, a very small part of the state's burden had these infants become blind.

State Institute on Conservation of Vision.—Under the direction of the New York State Commission for the Blind, prevention of blindness department, a two-day institute on prevention of blindness will be held in Buffalo, April 28 and 29. Of special interest will be the discussion on: The Anatomy and Physiology of the Eye; The Art of Illumination; Nutrition in Relation to the Eyes; Diseases of the Lids; The Eye in Diagnosis of General Diseases; Errors of Refraction; Muscle Imbalances; Adequate Follow-Up in Eye Cases; and Education of the Visually Handicapped. The prevention of blindness department of the New York State Commission for the Blind, at 80 Centre Street, New York City, will send detailed programs upon request.

Eye Defects Increasingly Noted in England.—There are indications of a gradual increase in eye defects in school children, according to a note in a recent issue of the *Medical Officer* (England). Doubt is expressed as to whether this increase is because more attention is now paid to vision inspection, or whether the adjuncts of modern living—the movies and artificial illumination—have taken a higher toll of sight. There is no doubt, however, that in cases of myopia the general maintenance of nutrition and hygiene is of great importance.

New Artificial Irradiation Protects Eyes.—The harmful effects of ultraviolet rays on the eyes have heretofore been counteracted by the wearing of cumbersome protective goggles during exposure to artificial sunlight. In Paris, a new method of administering artificial sunlight has been demonstrated; the lamps are directed toward the ceiling, from which the rays are reflected by small metal reflectors. Shades attached to the reflectors prevent direct irradiation, and, in looking up towards the ceiling, no dazzling effects are encountered. With this "artificial beach," children may be exposed for a longer period and may play without fear of danger to the skin or eyes.

Missouri Holds Rural Diagnostic Eye Clinics.—The Circuit Court Room of the Court House in Perryville, a town of nearly three thousand inhabitants and the county seat of Perry County, was the scene of an eye diagnostic clinic on March 14, when 265

persons from five counties registered for examination. The medical director of the Missouri Commission for the Blind, Dr. Harvey J. Howard, and two other members of the examining staff, Dr. W. E. Yount and Dr. H. L. Cunningham, drove a total of 360 miles in their own cars to the clinic and return. They worked from shortly after 8:00 a.m. to 6:30 p.m., giving their services without remuneration of any kind, and examined 140 persons, which included all of those who were still present at that late hour. No one was turned away without service who cared to stay.

Eye diagnostic clinics are held by the Department for Prevention of Blindness of the Missouri Commission for the Blind in various parts of Missouri, at the request of local interested organizations, sponsored by medical societies, wherever such exist, or by the doctors of the community.

Eye examinations are made by members of the examining staff of ophthalmologists of the Commission, assisted by members of the staff of the Department for Prevention of Blindness. The diagnoses form the basis for constructive work in the prevention of blindness. Underlying causes are discovered and recommendations made; no treatment is given at the clinics. The recommendations may be only corrective treatment for the eyes, or may involve a general physical examination for the removal of a remote constitutional cause, as focal infection or disease of a vital organ, such as the kidneys.

Community resources and interests are pooled to provide the necessary facilities. Rural communities rarely have ideal quarters. Whatever building or room is available is adapted to the needs and used satisfactorily; sometimes it is a school room, a court room, a church. Volunteer services of local interested individuals or organizations, added to the Department's personnel, care for the large number of persons who register. Medical and social records are secured, taken back to the office, analyzed and follow-up instigated for treatment, operation, hospitalization, sight-saving school work, or whatever is indicated by the recommendations of the examining doctors.

Often doctors, nurses, medical students and others attend the clinics for the professional advantages which accrue from observation and explanations given by the staff examiners.

Three medical social service workers specializing in eye work, Mrs. Dora Zane of Honolulu, T. H., Miss Clare Gillen of Cleveland, and Miss Dorothy Hosford of Philadelphia, took advantage of the opportunity afforded by the Perryville clinic to observe methods of providing service for a scattered population from a large, strictly rural area and later to study the methods of follow-up from the office of the Department for Prevention of Blindness in St. Louis.

Mrs. Zane was on a scholarship from the National Society for the Prevention of Blindness and was spending two weeks in Missouri for observation and experience, at the request of that organization. She had just completed four months at the Massachusetts Eye and Ear Infirmary and four weeks in New York and was returning to develop work for the promotion of eye health and prevention of blindness in the Hawaiian Islands. Miss Gillen and Miss Hosford are both on scholarships from the National Society for the Prevention of Blindness and are at present studying eye work at Washington University, St. Louis.

Sight-Saving in Canada.—"One Year on Exchange," the experiences of a Canadian sight-saving class teacher in a similar capacity in Glasgow, Scotland, is interestingly told in the January issue of *Serving Sight*, a publication issued by the Canadian National Institute for the Blind. Another article of interest, generally, to educators and those concerned with the problems of the partially sighted, is "A Few Observations by the Employment Department of the Canadian National Institute for the Blind," by J. F. Clunk, on vocations and training for partially sighted children. The author urges the principle that a normal outlook be cultivated in the visually handicapped. The workaday world cannot accept physical handicap as excuse for shirking or fleeing from reality. Extra education for the partially sighted child must be a genuine help in vocational placement and in his ultimate adjustment to life.

The Eye Is the Final Judge of Lighting.—All theories of lighting engineers must be put to the test of the human eye before they can be accepted. Among the problems that confront the illumination expert, said A. B. Read, in a paper read before the Institution of Electrical Engineers in England, are those of glare, contrast, shade

and color. The old method of casting all light downward is bad because the contrast between the amount of light on the working plane and the upper illumination is uncomfortable. A lighting too uniform also has the disadvantage of being tiring. A complete absence of shadows would not do for some types of work, such as sewing, where discrimination of threads in material of the same color would be almost impossible without shadows. In the discussion which followed, it was pointed out that the engineer usually considers only the normal eye, and that to include proper lighting for those with visual defects the help of an ophthalmologist is needed.

Physical Fitness in Aviators.—A plane is no better than the pilot who manages it, the pilot no more efficient than the eyes through which he sees to direct his machine and his cargo. Dr. E. H. Padden, flight surgeon for the United Air Lines, calls attention to the need in aviators of good vision, space perception, and eye muscle balance, in an article in *Medical Times and Long Island Medical Journal.*

Industrial Eye Accidents High in France.—From statistics gathered from leading ophthalmologists in France by the International Association for Prevention of Blindness, and reported by Prof. de Lapersonne in the August issue of *Protection*, the French safety journal, it is shown that eye accidents, minor and major, are of high frequency. In one automobile factory, with a total of 3,600 accidents a year, 10 to 12 eye accidents of minor severity occur a day, while only 11 serious accidents of any sort happen in a year. It is recognized that careful attention to these minor eye accidents can prevent greater complications. The possibility of making the use of goggles mandatory is dependent upon the perfection of goggles for facile seeing.

Glare Shield Protects Motorists.—Need of protection from glare, not only from oncoming headlights in night driving, but against the reflected glare of sunlight or snow, has been met by the use of a simple green shield which, operating on a spring device, may be set into place against the windshield, or, with a pressure of a finger, will turn up, out of the way, against the top of the car.

Reading with Closed Eyes.—A new use for the small X-ray machine has been described by Dr. A. H. Pirie in the November issue of the *Canadian Medical Association Journal.* For his demonstration he uses a perforated film which may be read with the eyes closed when X-rays are brought close to the lids. The practical value of this new use of X-ray is shown in many ways: a metallic foreign body in the eye may be made to cast its shadow on the retina and, through the use of a brass grid, the metal may be exactly located. In cases of complete opacity of the cornea, or of cataract, the field of vision may be mapped. Bits of glass, being fluorescent, may also be seen in the eye by the examining ophthalmologist.

Eye Defects and School Achievement.—What is the effect of certain physical factors upon the mental capacity of school children? This was the question that English health officers sought to answer in making a study of the school children in Falkirk and Stirling. Slight defects of vision were found decreasingly in the advanced groups, while the retarded groups showed an increasing number of children with slight visual defects. The more serious defects followed this same rule, showing up more strongly and at an earlier age in the retarded groups. Obvious conclusions are drawn, that visual defects blunt mental acuity.

Preventing Eye Accidents.—Prevention of eye accidents in plants and factories is an important item in the reduction of compensation costs and overhead, and safety directors have bent every effort to abolish this expensive calamity. Posters of warning, cracked goggles on display, rules and regulations regarding the wearing of goggles, have been used in the prevention campaign. In the plants where every person—workmen, foremen, executives and passing visitors—is required to wear goggles throughout departments where any eye hazard exists or might exist, the eye accident risk is reduced to nothing.

Do Eyes Contribute to Motor Casualties?—More thorough vision testing for applicants for automobile drivers' licenses, as a means of preventing accidents, was advocated by Maxwell Halsey, traffic engineer of the National Bureau of Casualty and Surety

Underwriters, in an address before the session on "The Eye" at the Fourth Annual Greater New York Safety Conference, held on March 1. "Present examinations," said Mr. Halsey, "covering color blindness, visual acuity and field of vision, do not necessarily tell whether the operator will or will not have accidents. There is a considerable demand for improvements in eyesight examinations which will not only tell what picture the eye sees, but what effect this has in the brain of the operator. It is suggested that eyesight tests cover such items as the ability of the operator to recognize a hazard; the timing of the operator (his ability to judge speed and distance); the ability of the operator to see 'the whole picture' and not merely one part of it; and the reaction time of the operator to pictures which show a hazard."

At this same session, which was sponsored by the National Society for the Prevention of Blindness, Dr. M. Davidson, ophthalmologist of the New York State Department of Labor, talked on "Eye Examination of Industrial Employees—Why and How?" and Mr. Louis Resnick, director of industrial relations of the Society, discussed "Elimination of Eye Hazards Through Engineering Revision."

Health Education Conference.—The American Child Health Association will hold its seventh Health Educational Conference in Ann Arbor, Michigan, from June 20 to 24, inclusive, at the invitation of the University of Michigan, Summer Session. As previously, the conduct of this Conference will be characterized by the co-operative work of all members, and the discussions will center on practical problems in the school health program in teacher, secondary and elementary education. Further information may be obtained from the Director of Educational Service, American Child Health Association, 450 Seventh Avenue, New York City.

Editors' Announcement.—The SIGHT-SAVING REVIEW will welcome letters or excerpts of general interest for its Forum section, assuming no responsibility for the opinions expressed therein. This section is offered as a medium for discussion and exchange of opinions, as well as for questions. Specialized questions will be turned over to consultants for authoritative reply. Every com-

munication must contain the writer's name and address, but these will be omitted on request.

National Society Notes.—The National Society reports with deep regret the death of two of its valued advisers and friends: Mr. Holbrook Fitz John Porter, member of its Board of Directors and of the Executive Committee; and Mrs. Corinne Roosevelt Robinson, who served from 1926 to 1931 as a member of the Board of Directors, and from 1931 until her death, as honorary vice-president.

The education of parents and teachers in the importance of eye hygiene is a large part of the program for conservation of vision. Mr. Lewis H. Carris, managing director, has talked on prevention of blindness and shown the film, "Conserving Sight and Preventing Blindness," to the parents of pupils at P. S. 89, New York City, and to the teachers of the New Jersey School for the Deaf; he also addressed the Vice Principals' Association, New York City. In the interests of conserving sight in industry, Mr. Carris acted as chairman of the section on "The Eye," of the Fourth Annual Greater New York Safety Conference, on March 1.

The annual conferences of the International Council for the Education of Exceptional Children and of the National Education Association, held in Minneapolis, February 20 to 24, were attended for the National Society by Mrs. Winifred Hathaway, associate director. Mrs. Hathaway participated in the program of the International Council for the Education of Exceptional Children with a paper on "Sight-Saving Classes." On this western trip she also had the opportunity to talk about sight-saving classes at Hamline University, St. Paul, Minnesota, and to speak to a meeting of sight-saving class teachers in Chicago.

Medical social work in eye clinics assumes an increasingly important rôle in the prevention of blindness. Miss Eleanor P. Brown, secretary, represented the Society at the Regional Conference of the American Association of Hospital Social Workers at New Orleans, Louisiana, on February 11 to 13, and presented a paper on "Social Service with Eye Patients." Miss Brown also visited the newly organized training course for medical social workers in eye clinics, being given jointly by the Washington University Clinics and Allied Hospitals, in St. Louis, Missouri.

Miss Mary Emma Smith, R.N., director of nursing activities of the National Society, gave a demonstration of preschool vision testing at the Bethlehem Day Nursery in New York City. She also talked to the New York Industrial Nurses Club on conservation of vision in industry.

The committee on statistics of the blind, a joint project of the National Society for the Prevention of Blindness and the American Foundation for the Blind, announces the appointment of Miss C. Edith Kerby, statistician of the National Society, to its membership.

Dr. Park Lewis, vice-president of the Society, has recently been appointed to the editorial staff of the *American Journal of Ophthalmology*. The University of Buffalo has also recently honored Dr. Lewis, in presenting to him the Chancellor's Medal for outstanding public service.

We are pleased to announce that Mr. John M. Schiff has accepted membership on the Board of Directors and Dr. Walter B. Lancaster has consented to serve on the Advisory Committee. The name of Mr. Schiff has long been known in the field of philanthropy; Dr. Lancaster is consulting ophthalmic surgeon to the Massachusetts Eye and Ear Infirmary in Boston.

Current Articles of Interest

Recent Advances in Ophthalmology, Oscar B. Nugent, M.D., *Clinical Medicine and Surgery,* January, 1933, published monthly by Clinical Medicine and Surgery, Chicago, Ill. The author shows the progress made in ophthalmology through the use of ultraviolet irradiation for diseases of the eye and for trachoma; he lists as advances transplantation of the cornea; the work done in retinal detachment, particularly through the work of Gonin; intracapsular operation for removal of cataract, as well as forceps extraction; the use of contact lenses; the use of the slit-lamp and the corneal microscope for the demonstration and localization of foreign bodies in the eye; the treatment of sympathetic ophthalmia through serums.

Glaucoma, Edward H. Cary, M.D., *New England Journal of Medicine,* December 8, 1932, published weekly by the Massachusetts Medical Society, Boston, Mass. The study of glaucoma has led ophthalmologists to realize that the eye is not in the body, but of the body; in other words, the disease, glaucoma, is generally secondary to a disease of the general system. Ophthalmologists should examine all patients over the age of thirty-five for symptoms of glaucoma, for only through early detection is the disease arrested and sight conserved. Treatment of the specific disease and suggestions for thorough study of the whole body are outlined.

Bacterium Granulosis Conjunctivitis Compared with That Produced from Human Trachoma, Ida A. Bengtson, *Public Health Reports,* December 9, 1932, published weekly by the United States Public Health Service, Washington, D. C. Culture inoculation of monkeys with *Bacterium granulosis* showed no difference from the infection caused by direct transfer of human trachoma, except in the fact that the former infection was of somewhat greater activity. The results show that the appearance of lesions in monkeys cannot be used in the study of human trachoma.

The Human Seeing Machine, M. Luckiesh and Frank K. Moss, *Progress,* January, 1933, published monthly by Street and Smith

Publications, Inc., New York, N. Y. The authors ask whether the fact that, at the age of 60, 95 per cent of the people have defective vision is due to natural degeneration of the visual apparatus, or whether the strain of working for years under inadequate illumination may be an important contributing cause to visual impairment. From their study of the human seeing machine, the eye, they have concluded that much visual impairment may be prevented when proper illumination for eye tasks is supplied. Experiment has shown, too, that nerve strain lessens with greater intensity of light and increases with diminution of light.

Etiology of Myopia, Frank H. Rodin, M.D., *Archives of Ophthalmology*, February, 1933, published monthly by the American Medical Association, Chicago, Ill. Reviewing the modern theories of the cause of myopia, the author finds no one dependable cause, but a combination of causes, which may be mechanical, hereditary or acquired. He finds that high myopia is a disease, while true, or low, myopia is a condition which after correction need give no further concern.

The Light That Doesn't Fail, P. R. Holmes, *National Safety News*, January, 1933, published monthly by the National Safety Council, Inc., Chicago, Ill. Modern artificial light is more dependable than daylight and it can also furnish the health-giving rays of real sunlight. More attention to lighting equipment in the plant will enable employees to perform their work with less strain and more safety.

School—Or a Job? Hugh Grant Rowell, M.D., *Hygeia*, February, 1933, published monthly by the American Medical Association, Chicago, Ill. A short story bears the moral that good eyes, as well as good general health, are necessary safeguards against possible accidents at work or play. A boy who feared to be called "four eyes" was converted to this realization.

Practical Points in Refraction of the Eye, Dunbar Roy, M.D., *Southern Medical Journal*, September, 1932, published monthly by the Southern Medical Association, Birmingham, Ala. From a study of the records of 18,000 patients, the writer has formulated some theories on the best methods of refraction. He suggests that

while refraction may appear to be an exact and mathematical science, it is rather an art which must be suited to the individual. He recommends the use of trial glasses in the ophthalmologist's office, and a more careful check-up of filled prescriptions.

Medical and Surgical Treatment of Squint, John H. Burleson, M.D., and J. Burleson Moore, M.D., *Texas State Journal of Medicine*, December, 1932, published monthly by the State Medical Association of Texas, Fort Worth, Texas. The writers urge that the watchful waiting method of treating squint be discarded, since treatment should be begun at the earliest moment. The causes and treatments of squint are various; each case demands individual study.

Temporary Changes in the Refraction of the Eye in Diabetics, R. Affleck Greeves, F.R.C.S., *British Medical Journal*, November 26, 1932, published weekly by the British Medical Association, London, England. A transient refractive change in the eyes of a patient may be a warning of diabetes. Two cases are reported in which the eye-grounds were normal, and only further physical study revealed the diabetic state. The refractive peculiarities disappeared after treatment with insulin was undertaken. Although others have studied this phenomenon, the underlying biochemical cause is still obscure.

On the Management of Ocular Injuries, William C. Finnoff, M.D., *Colorado Medicine*, January, 1933, published monthly by the Colorado State Medical Society, Denver, Colo. Since in no part of the body is the early management of injuries so essential as in the region of the eye, the author outlines procedure in treating eye injuries and injuries close to the eye.

The Care of the Eyes of Industrial Workers, Marcelli Shaw, M.R.C.S., *Journal of State Medicine*, December, 1932, published monthly by the Royal Institute of Public Health, London, England. Not only has the social conscience of the public and of employers awakened to the need of protecting the general health of workers, but the economic value of health conservation has also been demonstrated. Bearing in mind the fact that the eye is not in the body, but of the body, it is realized that many general sys-

temic diseases—nephritis, diabetes, venereal disease, and diseases of the cardiovascular system—may cause serious impairment of the vision. The most common eye disorder is eyestrain, caused by excessive use of the eyes, ofter under poor lighting conditions. Medical aid may advise lenses for correction of refractive errors, or counsel improved eye hygiene. Consideration of proper lighting is of paramount importance, and prompt recourse to medical aid in case of eye injury is advised.

Problems in Ophthalmology, Leo L. Mayer, M.D., *Illinois Medical Journal*, November, 1932, published monthly by the Medical Profession of Illinois, Oak Park, Ill. Brief résumé of current trends in ophthalmology, touching upon methods used in detachment of the retina, glaucoma, cataract, trachoma; and diseases of the lids, cornea, extra-ocular muscles, uvea and retina. A lengthy bibliography makes this article of special interest to those who wish to inform themselves of current practice in any special field of ophthalmology.

A Safe Method of Cataract Operation, J. S. Shipman, M.D., *Journal of the Medical Society of New Jersey*, November, 1932, published monthly by the Medical Society of New Jersey, Orange, N. J. The report of 100 cases of extra-capsular cataract extraction is given, with a full description of the technique. Results showed that needling for secondary cataract was necessary in little more than a quarter of the cases.

Diseases of Common Interest to the Dentist and the Ophthalmologist, William F. C. Steinbugler, M.D., *New York State Journal of Medicine*, November 1, 1932, published twice a month by the Medical Society of the State of New York, New York, N. Y. The relation between dental abnormalities and eye conditions has been long recognized; the author reviews the accepted theories on this relationship. The frequent types of dental abnormality causing eye infection are pyorrhea, caries and infection. The most dangerous form of dental infection is that involving the pulp, in which the diseased material is forced into the bloodstream and into remote regions of the body. The iris, ciliary body and choroid are the parts of the eye most frequently involved. Outlining accepted

forms of treatment for eye conditions following dental infection, the author concludes that, next to syphilis and tuberculosis, dental infection is the most common form of focal infection; while every effort should be made to preserve the teeth, it should be borne in mind that in doubtful cases the eye should be given first consideration, and the elimination of oral sepsis should take precedence over preservation of the teeth.

A School Health Program for the Physician, Allen G. Ireland, M.D., *Journal of the Medical Society of New Jersey*, November, 1932, published monthly by the Medical Society of New Jersey, Orange, N. J. A comprehensive and rounded school health program, aiming toward the ideal, rather than any program now in practice. The author stresses the co-ordination of education and health teaching, each bringing something to the development of a full, happy life.

Eye Diseases in Childhood, Charles Leonard Gimblett, M.D., *Mother and Child*, October and November, 1932, published monthly by the National Council for Maternity and Child Welfare, London, England. A lecture delivered during the special course in public health and general nursing at the College of Nursing stressed the common eye diseases and difficulties encountered among children. Included are ophthalmia neonatorum; lacrimal obstruction; acute conjunctivitis among school children, commonly known as "pink eye"; chronic conjunctivitis; visual impairments due to congenital syphilis; glaucoma, or buphthalmos; and cataract. Something of the etiology, course and treatment of these conditions is outlined.

Book Reviews

INJURIES OF THE EYE. Harry Vanderbilt Würdemann, M.D., Sc.D., F.A.C.S. Second Edition. St. Louis: The C. V. Mosby Company, 1932. 900 p. Ill.

This is the second edition of Würdemann's *Injuries of the Eye.* The first was published in 1911 and presented the author's experiences over a period of twenty-two years. This, the second edition, is the achievement of forty-two years of endeavor in the field of ocular injuries.

No attempt has been made to cover the literature completely. The work in the main represents, first of all, Würdemann's own personal experience. However, in cases where this has not been sufficient, he has not hesitated to use the findings of others. Although essentially practical in treatment, adequate pathological data have been included to elucidate the processes occurring in damaged tissues. The volume is handsomely illustrated—the color plates are excellent. Particularly interesting are the pictures dealing with the hazards of industry. There are numerous fine drawings made by the author himself.

The book is divided into three sections: first, "General Injuries"; second, "Injuries of Special Structures of the Eye"; third, "Forensic Medicine." Under the first heading, injuries due to mechanical, thermal, chemical and electrical forces are considered. Common types of injuries occurring in domestic life and in the industries are classified and described. It seems that the most serious eye accidents happen to men working in iron and steel. Especial attention is paid to sympathetic ophthalmia—that still little understood and disastrous condition in which, later, the uninjured eye also becomes involved. In the diagnoses of eye injuries Würdemann clearly demonstrates the use and value of the various aids, such as the ophthalmoscope, focal illumination, sideroscope and the magnet. The subject of biomicroscopy is dismissed with the statement that, in the author's opinion, while the slit-lamp is valuable as an academic instrument it is of no particular benefit in examining injury cases. However, an excellent and com-

prehensive discussion of radiography follows. The advice quoted from Dixon that "every injured eye should be X-rayed" is very significant. The chapter on the prophylaxis of injuries of the eye is well illustrated and contains the Goggle Code of the American Steel and Wire Company, giving the occupations in which the use of goggles is compulsory or desirable. It is the author's experience "that there is less difficulty in enlisting the support of the employer than the assent of the men to adopt precautionary measures."

In Part Two, "Injuries of the Special Structures," all kinds of injuries to the coats and contents of the eye, the lids, the orbit and to the visual nervous system are considered in great detail. The frequent use of pertinent case reports from the author's own extensive practice is highly commendable. This chapter is complete and up to date and by itself would be a worthy contribution.

The volume is concluded with a treatise on forensic medicine, which will be of value not alone to ophthalmologists but also to those interested in the industrial and social aspects of eye injuries. Here are considered medico-legal practice, protective legislation, pensions and accident insurance. In addition, a digest of workmen's compensation laws throughout the world is included. Under the caption of "Visual Economics," Würdemann gives his method for a scientific estimate of economic damage.

There is certainly no other book in the English language that so completely handles the subject of eye injuries; consequently, it is indispensable for reference purposes in this branch of ophthalmology.

MILTON L. BERLINER, M.D.

THE EXPERIMENTAL STUDY OF READING. M. D. Vernon. Cambridge: Cambridge University Press, 1931. 191 p.

Miss Vernon proposes "to give a concise account of any experimental work . . . which throws some light upon the psychology of reading." Few critical readers, however, will admit that all important material has been considered, or that parts of the author's discussion are relevant. The book is concerned mainly with a consideration of eye movements, perception, and legibility

in reading, with the major emphasis on eye movements, which constitute Miss Vernon's own field of study.

A survey of methods of observing and recording eye movements led to the justified conclusion that photographing a beam of light reflected from the cornea while the subject reads is most adequate although not ideal. The various types of eye movements are described with special emphasis on the relatively rapid saccadic moves employed in reading.

It is difficult to understand why sensations of eye movements are discussed, since this contributes nothing to an understanding of the reading process. Furthermore, the sections on visual perceptual processes in adults and in children, while adequately done, are somewhat superfluous and are not particularly relevant to the subsequent discussions of visual perception in reading.

The real contribution of this book is found in the section on eye movements in reading. Particular mention should be made of the important analyses of subjective accompaniments to variations in ocular behavior. The effect on eye movements of interest, relevant and irrelevant associations and imagery, and feeling-tone is cited from the author's own ably conducted investigations. She arrives at the important conclusion that a moderate kind of irregularity in sequence of reading movements need not be inconsistent with the best kind of critical appreciation. In fact, such irregularity may indicate the presence of "illustrative thought and rational reflection."

Because of inadequate methods of experimentation and conflicting results, little reliable information on legibility of print is available. Various typographical factors which may influence the legibility of single letters, words, and connected discourse are critically examined. The author's inference that "the criterion of legibility should be based upon the reading of children" because their reading is apt to be more analytical than that of adults, and because their reading habits are unstable, is valid only if (1) variation of typography affects reading performance of children, and (2) optimum typographical arrangement for children is also optimum for adults. Neither possibility has been established as fact, and indeed there is some evidence which indicates that the opposite may be true to a certain degree.

The book reveals an omission of citation and discussion of several studies whose consideration would have, in some instances, modified the author's conclusions. This is particularly true of the section on reading disabilities, and to a lesser degree, of the chapter on legibility. In view of the excellent sections on eye movements, however, the book is to be considered a valuable contribution in the field of reading.

MILES A. TINKER, Ph.D.

ARTIFICIAL LIGHT AND ITS APPLICATION IN THE HOME. The Committee on Residence Lighting, Illuminating Engineering Society, Mariquita Dygert, chairman. New York: McGraw-Hill Book Co., Inc., 1932. 145 p. Ill.

Until the last few decades, visibility and safety were the primary, if not the only, considerations in the use of artificial light. Of late years the incandescent electric lamp, independent of wind and draft and with its almost unlimited flexibility and low cost, has given importance to two other factors. These are comfort and beauty; and at the same time their antagonist, glare. To those who are sensitive to these things this book will offer innumerable interesting suggestions.

In looking over its contents, one wonders why the authors did not present the three strictly technological chapters, if not in a separate part, at least together and in sequence. "Characteristics of Incandescent Lamps" is the title of the third chapter; and "Fundamentals of Electricity" and "Wiring for the Home" of the fifth and sixth respectively. It would seem better that these should have been grouped, since the remainder of the book, from the point of view of the householder, deals with the more human aspect of the subject, from the lamp socket out, so to speak.

As to this latter unsegregated portion of the book, the first chapter is appropriately entitled "Light and People." One is here led through a brief sketch of the history of lighting. Light and shadows are discussed as "Fundamentals of Lighting." A chapter on "Light and Color" follows. Chapter seven discusses "Lighting Equipment"—fixtures, table and floor lamps, and glare, the enemy of comfort. The eighth and last chapter has suggestions to offer as to the lighting of the several rooms of the house.

It is realized that in those rooms in which the family principally lives the lighting equipment, whether lit or not, and the distribution of light must be considered in connection with the other furnishings and decorations of the room. The two are not separable—they are parts of a single decorative scheme. To this end, naturally, it is impossible to lay down hard and fast principles or definite rules of practice. Taste—a good taste—must govern, and suggestions are of value. These are copious, both in the text and in the numerous illustrations.

The three technological chapters should present no difficulty to the layman who is interested, but neither here nor elsewhere is the material, in general, explicit or full enough to warrant the hope, intimated in the foreword, that the volume will find favor as a textbook. Rather, it is a source of ideas, in the matter of lighting, for the home-builder and home-maker.

Not from the lines of the text, but from a consideration of the personnel, does it appear that the authorship is commercial-minded. This fact, together with limitation of space, will assure the reader that he will find nothing in the book that is not good for him to know.

The text is followed by a very short dictionary of illumination terms and a list of questions on each chapter for the benefit of the student.

PERCY W. COBB, M.D.

THE EFFECT OF COLOR ON VISUAL APPREHENSION AND PERCEPTION. Miles A. Tinker. Worcester: Clark University Press, Genetic Psychology Monographs, XI, February, 1932, pp. 61–136.

During the last ten years the tendency has increased rapidly to use color and color combinations in conveying messages through visual symbols. Familiar examples include posters, billboards, automobile licenses, and newspaper and magazine advertisements. As pointed out by Tinker, "two important justifications for the use of color in advertisements and the like are attention value and the pleasant feeling-tone which they arouse. In employing colors for these purposes there is danger that the word or word symbols may lack adequate visibility." In view of the limited amount of scientific experimentation in this field, Dr. Tinker recently carried

on a series of studies to secure accurate knowledge of the effect of color on visual apprehension and perception.

The effect of color was measured in this study by an analysis of apprehension scores for a homogeneous series (all symbols on any stimulus card being of the same color) and for a heterogeneous series (each succeeding letter being of a different color). The study aimed also to determine "the influence of affective value, attention value, and luminosity of colors on apprehension and perception of symbols" and the influence of letter position on visual apprehension.

Thirty-two stimulus cards were used in the homogeneous series and twenty-four in the heterogeneous series. The colors used were black, orange, violet, blue, red, neutral gray, green, yellow. Fifty men and 50 women students participated in the experiment with homogeneous colors, and 100 men and 100 women in the heterogeneous series. Each stimulus card was exposed for three seconds. The effect of color was determined by the method of paired comparisons.

Great care was observed at each step in the study to insure accurate results. For example, the tests were scored in three different ways and the advantages and limitations of each method determined. The reliability of the results was determined "by correlating the scores of the odd versus the sums of the even scores and then applying the Brown-Spearman's 'proflicacy' formula." The findings were also checked with the results of related experiments. One may accept with considerable confidence, therefore, the following conclusions: "The all-important determinant of visual apprehension and perception of printed words, letters, and similar symbols is the luminosity contrast between character and background"

It will not be possible in the space available to review the various significant findings. They have a direct bearing, however, upon printing situations in which colors are employed for attention value, affective value, and the like. Wherever quickness of perception is essential, "care should be taken to use a color or brightness combination which produces a maximum brightness contrast between symbol and background." The report should be of special interest not only to those responsible for the preparation of ad-

vertising materials, but also to those who are concerned in any way with reading and pictorial materials for children and adults with defective vision.

WILLIAM S. GRAY, Ph.D.

Briefer Comment

THE STORY OF MEDICINE. Victor Robinson, M.D. New York: Albert and Charles Boni, 1931. 527 p.

The author traces the history of medicine from the stone age down to the modernization of medicine and medicine as it is practised in America. The book is well written and the material interestingly presented. Since the story is one of general medicine, it is perhaps not surprising that so little space has been given to the advances of ophthalmology, which is of especial interest to us. There are a few allusions to optical developments, and the chapter on the modernization of medicine includes a description of the work of Credé in finding the prophylactic, silver nitrate, for the prevention of blindness in newborn babies.

It is perhaps well for those of us who are concentrating on the care of the eyes to read a book like this, which shows so logically that the eye is, after all, only a part of the body, and which makes us conscious of the importance of keeping the body, as a whole, well.

SAFETY AND HEALTH OF THE SCHOOL CHILD: A SELF-SURVEY OF SCHOOL CONDITIONS. James Frederick Rogers, M.D. Washington: United States Office of Education, 1932. 29 p.

A brief and comprehensive questionnaire on school health projects, through which school heads may find a reliable self-appraisal of the school health program. Physical conditions of the school—ventilation, illumination, sanitary conditions—and facilities for health practice and precept are questioned; remarks and suggested bibliography are added to show proper practices in health education.

ORGANIZATION AND ADMINISTRATION OF A STATE PROGRAM OF VOCATIONAL REHABILITATION. Bulletin No. 161, Federal Board for Vocational Education. Washington: United States Government Printing Office, 1932. 59 p.

A discussion of the principles and methods involved in the organization and administration of a state program of vocational rehabilitation, prepared under the direction of the Federal Board for Vocational Education. This bulletin has endeavored to find the best current methods of initiating and sustaining state and local programs of rehabilitation to serve as a guide in similar projects throughout the nation.

ANNUAL REPORT OF THE INSTITUTION FOR THE CHINESE BLIND, 1931. 22 p.

Marking the twentieth year of the existence of this school for the Chinese blind, this anniversary booklet shows the growth of the school, the activities of the pupils, the aims of the school to train its pupils toward a full life, and the need for more of this work in China.

ANNUAL REPORT OF THE CANADIAN NATIONAL INSTITUTE FOR THE BLIND. 1931–1932. 93 p.

Of particular interest to readers of the SIGHT-SAVING REVIEW is the part of the annual report of the Canadian National Institute for the Blind dealing with the activities of the prevention of blindness department. Trachoma has continued to receive its full appropriation from public health and governmental sources, since any economy in this direction would result in far greater expenditure later. Sixteen sight-saving classes are now in operation in Canada and, during the past year, it has been arranged to have large type books printed in Canada for these classes. The establishment of a sight-saving magazine, *Serving Sight*, has added materially to the resources and inspiration of the teachers of sight-saving classes and others interested in the prevention of blindness. The mimeographed stories of sight saving for school children have been widely distributed and have aided in spreading the message of sight conservation.

Contributors to This Issue

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As an ophthalmologist of the New York State Department of Labor, **Dr. Morris Davidson** has had wide experience with compensation claims in cases of eye accidents, as well as with the development of visual standards in industry.

In addition to filling the office of secretary for the National Society for the Prevention of Blindness, **Miss Eleanor P. Brown** represents the Society in many of its co-operative medical social projects.

Among the book reviewers: **Dr. Milton L. Berliner** is on the staff of the Cornell Medical College's ophthalmic clinic and the New York Eye and Ear Infirmary; **Dr. Miles Tinker** is assistant professor of psychology at the University of Minnesota; **Dr. Percy W. Cobb** is associate professor of applied biophysics in ophthalmology at the School of Medicine, Washington University, St. Louis; **Dr. William S. Gray,** professor of education at the University of Chicago, has been particularly interested in the study of reading and its associated problems.